General Catalogue

2003-2004

University of Massachusetts Dartmouth

General Catalogue
Volume 7, Number 6

For University of Massachusetts policies see http://www.umassp.edu/policy/

Accreditation

University of Massachusetts Dartmouth is accredited by the New England Association of Schools and Colleges, which accredits schools and colleges in the six New England states. Membership in the Association indicates that the institution has been carefully evaluated and found to meet standards agreed upon by qualified educators. Many specific programs are also accredited by professional or educational associations, as stated in the college and departmental sections of this publication.

Compliance

The University of Massachusetts Dartmouth complies with both the intent and spirit of appropriate federal and state antidiscrimination laws including Title VII of the Civil Rights Act, Title IX of the Educational Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Act of 1990.

Statement of Equal Opportunity and Affirmative Action

University of Massachusetts Dartmouth wholeheartedly supports and encourages the development of action programs designed to promote the employment and advancement of women, Blacks, Latino, Asians, Native Americans, persons with disabilities, and Vietnam-era Veterans as a means of assuring compliance with the provisions of campus Affirmative Action plans.

The University firmly supports the concept of equal opportunity without regard to an individual's race, color, age, religion, gender, sexual orientation, national origin, disability, or veteran status as it applies to his/her employment, admission to and participation in the University's programs and activities, provision of services, and selection of vendors who provide services or products to the University.

The following person has been designated to handle inquiries regarding the nondiscrimination policies: Assistant Chancellor for Equal Opportunity/Diversity/Outreach, Foster Administration Building, Room 323, University of Massachusetts Dartmouth, 285 Old Westport Road, North Dartmouth, MA 02747. Telephone 508 910-6405.

Inquiries concerning the application of nondiscrimination policies may also be referred to the Regional Director, Office for Civil Rights, US Department of Education, J. W. McCormack Building, Room 222, Boston, MA 02203

Resolution in Support of Pluralism

The Board of Trustees affirms its commitment to maintaining an academic environment which fosters pluralism, mutual respect, appreciation of divergent views, and awareness of the importance of individual rights. To this end, we reassert the importance of civility and the valuable contribution that diversity in race, ethnicity, religion, sexual orientation and culture brings to the University community, and therefore we strongly encourage and support racial, ethnic, cultural and religious pluralism. (University of Massachusetts, 6/3/92)

Policy Against Intolerance

The Board of Trustees denounces intolerance, particularly that based on ethnicity, culture, religion, race or sexual orientation which interferes with those rights guaranteed by law, and insists that such conduct has no place in a community of learning. We also recognize the obligation of the University to protect the rights of free inquiry and expression, and nothing in the Resolution in Support of Pluralism or Policy Against Intolerance shall be construed or applied so as to abridge the exercise of rights under the Constitution of the United States and other Federal and State laws. (University of Massachusetts, 6/3/92)

Statement on Cultural Diversity and Inclusion

University of Massachusetts Dartmouth affirms its strong support and deep commitment to the continued development and maintenance of an academic community in which the individual dignity and potential of each of its members are given full respect, recognition, and encouragement. Our goal is an institution in which all may study, live, and work securely and productively in an atmosphere characterized by civility and openness to the pursuit of academic excellence in the finest tradition of academia.

University of Massachusetts Dartmouth is opposed to and condemns racism. Acts of harassment, intimidation, or invasion of privacy which interfere with the rights of an individual or group to participate in the activities of the academic community shall be considered to be in violation of this policy and may be dealt with appropriately under applicable University codes and as regulated by statute.

We recognize the affirmative obligation of the University to foster a diverse and integrated learning environment. To this end, the University has a responsibility to vigorously pursue efforts to attract minorities, women, and members of other historically disadvantaged groups as students, faculty members, and staff in sufficient numbers to alleviate isolation and to ensure real integration and diversity in academic life. We also recognize our obligation to nurture community-wide appreciation of cultural diversity and will dedicate appropriate resources to meet this commitment on an on-going basis

Statement on Sexual Harassment

Sexual harassment is sex discrimination and, therefore, a violation of federal and state law. It is the policy of the University of Massachusetts that no member of the University community may sexually harass another. For purposes of this policy and consistent with federal regulations, sexual harassment is defined as follows

Unwelcomed sexual advances, requests for sexual favors and other verbal or physical conduct of a sexual nature constitute sexual harassment when

1.
submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment or academic work,

2.
submission to or rejection of such conduct by an individual is used as the basis for employment or academic decisions affecting such individual or

3.
such conduct has the purpose or effect of unreasonably interfering with an individual's work performance or creating an intimidating, hostile or offensive working or academic environment.

It is the policy of the University of Massachusetts to protect the rights of all persons within the University community by providing fair and impartial investigations of all complaints brought to the attention of appropriate officials. Any member of the University community found to have violated this sexual harassment policy will be subject to disciplinary action.

Chancellors are directed to take appropriate measures to inform each member of the University community of this policy statement and to develop procedures, in conjunction with the President's Office, for filing, hearing, and resolving complaints. (University of Massachusetts, 6/3/92)

Statement on Gender Discrimination

University of Massachusetts Dartmouth is committed to ensuring equality and avoiding gender discrimination. Therefore, it is the University policy to avoid, in all University publications and communications, the use of language that perpetuates gender bias. University employees are encouraged to use gender-neutral language In selecting textbooks and readings of the very highest quality, faculty are urged to select those that are free of gender bias.

University of Massachusetts
Dartmouth

General Catalogue
2003—2004

Undergraduate Programs and Courses, Policies, and Procedures

University of Massachusetts Dartmouth (USPS #015-139)
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Purposes of this Catalogue

This catalogue is the official source of information about the University's undergraduate academic programs, its approved courses, and associated policies and procedures. Its purpose is to guide students in planning a course of study and in meeting program, department, and University requirements; and to provide information about the University to students, employees, applicants, parents, teachers, counselors, and the general public. See the table of contents and index for an outline of the information provided.

This catalogue emphasizes the university's undergraduate programs. For centrality of reference, however, it lists all current graduate as well as undergraduate courses of the university. Please consult the *Graduate Catalogue* for detailed graduate program information.

The information in this catalogue should be current for the time of publication, although some changes may have occurred between the time of going to press and the opening of the academic year. *The University reserves the right to change at any time the degrees, programs, and services offered, the requirements, and the courses.* Corrections of errors may also be made. All official changes and corrections will be filed with the Office of Academic Affairs/Graduate Studies and the Registrar.

Such charges as tuition and fees, the policies associated with such charges, and academic or general University policies are subject to change without notice. There will be no refund of tuition, fees, charges, or any other payments made to the University in the event that the operation of the University is suspended at any time as a result of any act of God, strike, riot, or disruption, or for any other reasons beyond the control of the University.

The information in this publication is provided solely for the convenience of the reader, and the University expressly disclaims any liability which may otherwise be incurred. This publication is neither a contract nor an offer to make a contract.

More information available on World Wide Web

The University of Massachusetts Dartmouth home page can be reached on the Internet's World Wide Web at:

http://www.umassd.edu

This complete catalogue, plus much more information about different aspects of the University, can be found from our home page.

As this catalogue went to press, our constantly growing Web pages included not only detailed information about administrative and student offices and programs (Admissions, Career Services, Financial Aid, Sports, Student Organizations, to list just a few) but also specific sites or home-pages for many academic programs, special research or outreach projects, University news releases, personnel announcements, special events announcements, and a large variety of publications. Applicants can apply for admission using forms and instructions available on the Web.

Most UMass Dartmouth programs host web sites of their own, accessible from our general site referenced above. There are also links to the other UMass campuses and to general information about the University of Massachusetts.

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Academic Programs at UMass Dartmouth

College of Arts and Sciences

Department of Biology
Biology BS
  Students may select an option:
    Marine Biology
Biology/Marine Biology MS

Department of Chemistry
Chemistry BS
  Students may select one of these options:
    Biochemistry
    Environmental Chemistry
    Pre-Medical Chemistry
    BS-MS Option
Biochemistry Minor
Chemistry Minor
Chemistry MS
Chemistry PhD, Joint Program with UMass Lowell

Department of Economics
Economics BA
Economics Minor

Department of Education
  Through either undergraduate or post-baccalaureate certificate programs, students may prepare for initial licensure as:
    Elementary Education Teacher (1-6)
    Teacher of Biology (8-12)
    Teacher of English (5-8) (8-12)
    Teacher of French (5-12)
    Teacher of History (5-8) (8-12)
    Teacher of Mathematics (5-8) (8-12)
    Teacher of Music (preK-12)—see Music below
    Teacher of Physics (8-12)
    Teacher of Political Science/Political Philosophy (5-8) (8-12)
    Teacher of Portuguese (5-12)
    Teacher of Spanish (5-12)
    Teacher of Visual Art (preK-8) (5-12)—see Art Education below

Department of English
English BA
  Students will select one of these options:
    Drama/Film Studies
    Literature
    Writing/Communication
Drama/Film Studies Minor
Literature Minor
Writing/Communication Minor
Professional Writing MA

Department of Foreign Literature and Languages
French BA
French Minor
German Minor
Spanish BA
Spanish Minor

Department of History
History BA
History Minor

Department of Mathematics
Mathematics BS or BA
  Students may select an option:
    Computer-Oriented Mathematics (BS only)
Mathematics Minor

Department of Medical Laboratory Science
Medical Laboratory Science BS
  Students will select one of these options:
    Biotechnology
    Clinical
    Cytotechnology
Post-Baccalaureate Certificate in Molecular Forensics

Department of Philosophy
Philosophy BA
Philosophy Minor

Department of Political Science
Political Science BA
Political Science Minor

Department of Portuguese
Portuguese BA
Portuguese Minor

Department of Psychology
Psychology BA
Psychology BA-MA option
Psychology MA
  Students will select one of these options:
    Clinical/Behavioral Psychology
    General Psychology

Department of Sociology
Sociology BA
  Students may select one of these options:
    Anthropology
    Criminal Justice
Anthropology Minor
Sociology Minor

Interdepartmental
Humanities and Social Sciences BA
Multidisciplinary Studies BA or BS
Master of Art in Teaching MAT
  Students prepare for professional licensure in:
    Elementary Education Teacher (1-6)
    Teacher of Biology (8-12)
    Teacher of English (5-8) (8-12)
    Teacher of French (5-12)
    Teacher of General Science (5-8)
    Teacher of History (5-8) (8-12)
    Teacher of Mathematics (5-8) (8-12)
    Teacher of Physics (8-12)
    Teacher of Political Science/Political Philosophy (5-8) (8-12)
    Teacher of Portuguese (5-12)
    Teacher of Spanish (5-12)
    Teacher of Visual Art (preK-8) (5-12)—see Art Education below
Pre-Law Program
Pre-Medical Program
African and African-American Studies Minor
Gerontology Certificate
Gerontology Minor
International Marketing/French Certificate
Judaic Studies Minor
Labor Studies Certificate
Labor Studies Minor
Women's Studies Minor

Charlton College of Business

Department of Accounting and Finance
Accounting BS
Finance BS
Post-Baccalaureate Certificate in Accounting

Department of Management
Management BS

Department of Marketing and Business Information Systems
Business Information Systems BS
Marketing BS

Interdepartmental
Master of Business Administration MBA
Master of Business Administration/Juris Doctor MBA/JD (joint program with Southern New England School of Law)
Post-Baccalaureate Certificate in Management
Business Administration Minor
International Business Certificate

Listed by college and department are undergraduate majors and their formal options, with the degree offered; undergraduate minors; graduate programs and their formal options, with the degree offered; and formal certificate programs.

College of Engineering

Department of Civil and Environmental Engineering
Civil Engineering BS

Department of Computer and Electrical Engineering
Computer Engineering BS
Electrical Engineering BS
Computer Engineering Minor
Electrical Engineering Minor
Computer Engineering MS
Electrical Engineering MS
Electrical Engineering PhD
  Students will select one of these options:
    Electrical Engineering
    Computer Engineering
Post-Baccalaureate Certificates in Acoustics, Communications, Computer Systems Engineering, Digital Signal Processing, Electrical Engineering Systems

Department of Computer and Information Science
Computer Science BS
Computer Science Minor
Software Engineering Minor
System Software Minor
Computer Science MS
Post-Baccalaureate Certificate in Computer Science

Department of Mechanical Engineering
Mechanical Engineering BS
  Students may select an option:
    Manufacturing
Mechanical Engineering MS

Department of Physics
Physics BS
  Students may select an option:
    Materials Science
Environmental Physics Minor
Physics Minor
Physics MS

Department of Textile Sciences
Textile Chemistry BS
Textile Science BS
  Students may select an option:
    Applied Fiber Materials
Textile Chemistry MS
Textile Technology MS

Interdepartmental
Post-Baccalaureate Certificate in Computer Systems (Departments of Computer and Information Science and Electrical and Computer Engineering)

College of Nursing

Departments of Adult and Child Nursing and Community Nursing
Nursing BS
  Students are accepted into either the Basic Program or the RN track
  RN track students may select an option:
    BS-MS option
Nursing MS
Post-Baccalaureate Certificate in Nursing Education
Post-Baccalaureate Certificate in Nursing Leadership/Management
Post-MS Adult Nursing Practitioner Certificate

College of Visual and Performing Arts

Department of Art Education
Art Education BFA
Art Education MAE

Department of Art History
Art History BA
Art History Minor

Department of Design
Textile Design/Fiber Arts BFA
Visual Design BFA
  Students will select one of these options:
    Ceramics
    Electronic Imaging
    Graphic Design
    Illustration
    Jewelry/Metals
    Photography

Department of Fine Arts
Painting/2D Studies BFA
Sculpture/3D Studies BFA

Department of Music
Music BA
  Students may add one of these options:
    Music Education
    Music Technology
    Western Music
    World/African-American Music
Music Minor
Music Therapy Minor

Interdepartmental
Master of Fine Arts MFA
  Students will select one of these studios:
  Artisanry Studios
    Ceramics, Jewelry/Metals, Fibers/Textile Design, Wood and Furniture Design
  Fine Arts Studios
    Drawing, Painting, Printmaking, Sculpture
  Visual Design Studios
    Graphic Design, Electronic Imaging, Illustration, Multi-Media, Photography, Typography
Certificate in Artisanry
Certificate in Fine Arts

School of Marine Sciences and Technology

Marine Sciences and Technology MS (jointly with UMass Amherst, Boston, and Lowell)
  Students will select one of these options:
    Modelling Marine and Atmospheric Systems
    Biogeochemical Cycles, Environmental Changes
    Coastal Systems Science
    Ocean and Human Health
    Integrated Coastal Management
    Living Marine Resources Science/ Management
    Marine Observation Biotechnology

Marine Sciences and Technology PhD (jointly with UMass Amherst, Boston, and Lowell)
  Students will select one of these options:
    Modelling Marine and Atmospheric Systems
    Biogeochemical Cycles, Environmental Changes
    Coastal Systems Science
    Ocean and Human Health
    Integrated Coastal Management
    Living Marine Resources Science/ Management
    Marine Observation Biotechnology

Interdisciplinary Graduate Program

Biomedical Engineering/Biotechnology PhD (jointly with UMass Boston, Lowell, and Worcester)

Interdisciplinary Special Programs/ Curricula

Honors Program
Individualized Post-Baccalaureate Certificate Program (allows individuals with bachelor's degrees to design their own certificate program)
UMass Dartmouth/Southern New England School of Law Three-Plus-Three Program

Accreditations

UMass Dartmouth has full accreditation from the regional accrediting organization for New England higher education institutions:

New England Association of School and Colleges (NEASC).

Some academic fields have external accrediting agencies which review and accredit academic programs or the campus, in addition to regional accreditation. These agencies accredit programs either at the undergraduate level only or at all levels of study.

The following specific UMass Dartmouth programs are accredited:

Art Education, Art History, Visual Design, Textile Design, Artisanry, and Fine Arts	National Association of Schools of Arts and Design (NASAD)
Chemistry (BS level)	American Chemical Society (ACS)
Civil Engineering, Computer Engineering, Computer Science, Electrical Engineering, Mechanical Engineering (BS levels)	Accreditation Board for Engineering and Technology
MBA, Accounting, Business Information Systems, Finance, Management, Marketing	AACSB International (Association to Advance Collegiate Schools of Business)
Medical Laboratory Science	National Accrediting Agency for Clinical Laboratory Sciences (NAACLS)
Nursing	The National League for Nursing Accrediting Commission (NLNAC)
Teacher Certification program, Master's of Art in Teaching, Art Education	Commonwealth of Massachusetts Department of Education/National Association of Departments of Teacher Education (NASDTEC)

UMass Dartmouth's External Identification Numbers

College Board	3786
FAFSA	002210
IPEDS UNITID	167987
FICE/OPEID	002210
Federal TIN	04-3167352
DUNS (Dunn & Bradstreet)	78-395-6568

Carnegie Classification

Master's (Comprehensive) Universities and Colleges I

Introduction to the University

The University of Massachusetts

Founded as an agriculture college in Amherst in 1863, the University of Massachusetts is a uniquely American institution, a public land-grant university. Such institutions have three basic characteristics:

•
First, they are "people's universities," intended to serve all students who can do the academic work.

•
Second, they are committed to practical as well as theoretical education.

•
Third, they put new knowledge to work for the common good.

With those firm guidelines and a modest start from the sale of federal lands, the Amherst college grew to become the modern University of Massachusetts, the largest university, public or private, in New England. The UMass of today includes campuses in Amherst, Boston, Dartmouth, and Lowell and a medical school in Worcester.

The University of Massachusetts Dartmouth

UMass Dartmouth provides educational programs, research, and continuing education services in the liberal and creative arts and sciences and in the professions. It offers a broad range of baccalaureate and graduate degrees vital to the economic and cultural well-being of the region and the Commonwealth.

The Dartmouth campus traces its roots to 1895. In that year the legislature chartered the New Bedford Textile School and the Bradford Durfee Textile School in Fall River.

As the region's economic base shifted from textiles to more diverse manufacturing and service industries, the colleges changed too. They diversified their curricula, responding to the needs of new generations of students. By the middle of the 20th century they were growing rapidly, spurred by such forces as the GI Bill and the clear economic and social advantages of a well-educated citizenry. They had become multipurpose institutions, preparing engineers, health care workers, teachers, and business leaders.

In 1962 the state legislature created Southeastern Massachusetts Technological Institute by merging the New Bedford Textile School and the Bradford Durfee Textile School. The 710 acre campus in North Dartmouth, part way between New Bedford and Fall River, was begun in 1964. The dramatic campus design was the work of architect Paul Rudolph, then dean of Yale's School of Art and Architecture.

There was a clear public demand for a comprehensive university, and in 1969 SMTI became Southeastern Massachusetts University.

The university continued to grow through the 1970s when its residence halls were finished and through the '80s as research and studio facilities came into being. In 1988 the Dion Science and Engineering Building was opened, as was the Cedar Dell Townhouse Complex. Also in 1988, the Swain School of Design merged with the university's College of Visual and Performing Arts, strengthening programs in art and artisanry. The Swain merger brought additional art facilities in New Bedford to the university.

In 1991 a new University of Massachusetts structure combined the Amherst, Boston, and Worcester campuses with Southeastern Massachusetts University and the University of Lowell. Thus Southeastern Massachusetts University became the University of Massachusetts Dartmouth.

In 1994 UMass Dartmouth received approval to offer its first PhD degree, in Electrical Engineering. It also offers several joint doctoral programs with other UMass campuses.

In 1997 construction was completed of the building for the present School for Marine Science and Technology, located on 2.6 acres in New Bedford near Buzzards Bay. A full program of research and development is supported in this facility. Two new student residence buildings were completed in 2002. Starting in 1997, student/faculty teams have engaged in landscaping beautification projects across campus.

UMass.Dartmouth has more than 8,000 students, 3,200 of whom live on campus. It offers 37 undergraduate majors, 19 master's degree programs, four PhD degree programs, and has more than 320 full-time faculty.

Mission Statement of the University of Massachusetts

The University's mission is to provide an affordable education of high quality and conduct programs of research and public service that advance our knowledge and improve the lives of the people of the Commonwealth.

"...it is for life, not only for a living, that we must prepare our students."
— William M. Bulger, President

Strategic Priorities of the University of Massachusetts

1)
The University shall maintain the highest standard of academic excellence.
The University of Massachusetts shall provide a quality, affordable university education to the citizens of the Commonwealth. The University shall strive to serve all qualified students regardless of their economic means. The University shall pursue distinction in its research and scholarship.

2)
The University shall maintain an atmosphere where each person, regardless of religious, ethnic, economic or social background, will be comfortable.
The University shall enroll and employ a diverse community of people.

3)
The University shall offer and promote distinctive forms of public service.
The University of Massachusetts shall provide the state with policy research, programs, and leadership to address public needs. The University shall support efforts to improve primary and secondary education and shall expand its continuing education programs to encourage lifelong learning. The University shall continue to promote the economic development of the state and its regions.

4)
The University shall develop and manage its resources effectively.
The University shall wisely manage existing resources and aggressively develop new sources of revenue to meet operating and capital needs.

5)
The University shall demonstrate the excellence and advance the unique missions of its five campuses.
The University shall encourage its five campuses to pursue with distinction their respective strengths and strive to serve the best interests of their communities.

Mission and Vision Statements of the University of Massachusetts Dartmouth

Mission Statement

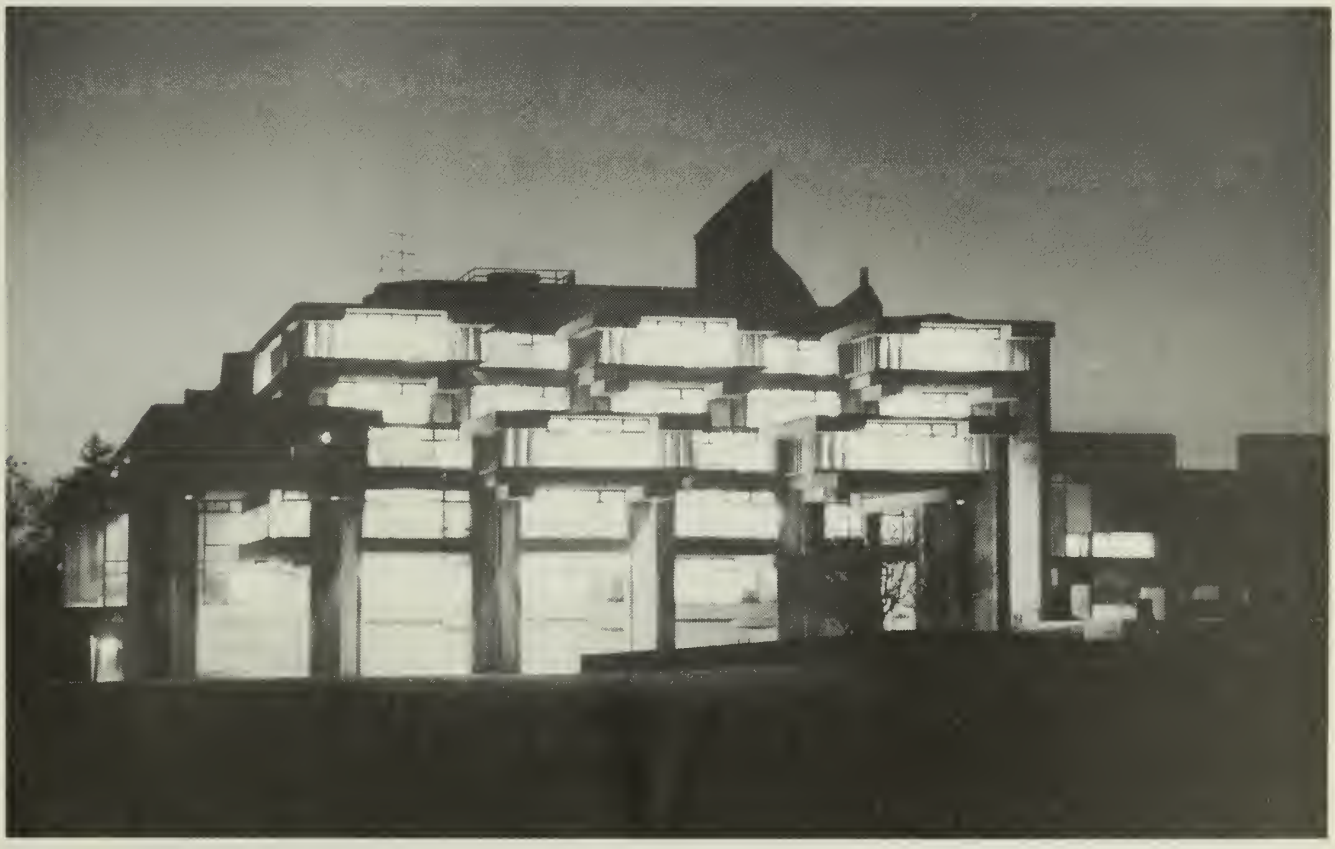
The University of Massachusetts Dartmouth distinguishes itself as a vibrant public university actively engaged in personalized teaching and innovative research, and acting as an intellectual catalyst for regional economic, social, and cultural development.

Vision Statement

Within a climate that is inclusive, open, and diverse, UMass Dartmouth will be the university of choice for students seeking high quality liberal arts and science programs as well as professional academic programs that build a foundation for civic responsibility, individual skills and professional success.

UMass Dartmouth will distinguish itself by providing a personalized academic environment where the scholarly research and creative activities of faculty and graduate students are interwoven with the undergraduate experience.

UMass Dartmouth aspires to create additional Masters and Doctoral programs, with commensurate support, in addition to enhanced technological capabilities for the delivery of our educational and outreach programs.



Academic Calendar

2003-2004

First Semester – Fall 2003

Monday, September 1	Academic year commences
Monday, September 1	Labor Day, no classes
Tuesday, September 2	Fall classes begin Freshman Convocation
Monday, October 13	Columbus Day, no classes
Wednesday, October 15	Follow Monday's schedule
Tuesday, November 11	Veterans' Day, no classes
Wednesday, November 26	Thanksgiving recess begins (after last class or lab)
Monday, December 1	Class resume, 8:00 am
Friday, December 12	Fall classes end
Tuesday, December 16	Examinations begin
Monday, December 22	Examinations end

Intersession 2004

Friday, January 2	Intersession commences
Monday, January 19	Martin Luther King Jr.'s Birthday University closed
Thursday, January 22	Last intersession class day
Friday, January 23	Intersession Final examinations

Second Semester – Spring 2004

Monday, January 26	Spring classes begin
Monday, February 16	Presidents' Day, no classes
Friday, March 12	Spring vacation begins (after last class or lab)
Monday, March 22	Classes resume, 8:00 am
Monday, April 19	Patriots' Day, no classes
Tuesday, April 20	Follow Monday's schedule
Wednesday, May 5	Honors Convocation
Tuesday, May 11	Spring classes end
Wednesday, May 12	Study Day
Thursday, May 13	Examinations begin
Wednesday, May 19	Examinations end
Sunday, May 23	Commencement

Admission to the University

Phone: 508-999-8605
www:umassd.edu

Undergraduate admission to the university is selective, based on academic performance and promise. The university is interested in applicants whose scholastic performance, aptitude, interests, character, and study habits give promise of success.

UMass Dartmouth admits its applicants into a specific curriculum, which is either a certain major or a cluster of majors. Applicants are evaluated both by general standards of qualification to do university work and by special standards for admission into the academic areas that they request. Access to programs may be limited by constraints of space and financing.

Each applicant's overall record is assessed for both strengths and weaknesses as indicated by such records as the candidate's secondary school class standing; subjects completed, curricular levels, and grades received; SAT or ACT scores; college-level records for transfer applicants; and other appropriate indicators. This approach gives attention to each applicant as an individual. We do not make admissions decisions based on quotas or formulas.

UMass Dartmouth admits applicants by "rolling admission." This means that there is no set deadline and qualified candidates will be accepted until the time when the university's capacity has been reached in the program of choice.

Interviews and Campus Visits
We invite applicants and family members to visit the campus and become acquainted with the university. A personal interview is not required. Several times each week from October to April, and on many Saturdays, the Admissions Office schedules information sessions and campus tours. Tours are also available during the summer. Individual tours can also be arranged. Those interested are invited to call. Classroom visits may be arranged in some majors.

General Application Procedures

Freshman applicants should complete their applications as soon as possible after the conclusion of the first marking period of their senior year, preferably before the end of December and at the latest by March. Transfer applicants should apply as soon as they can after their fall semester grades are available.

As soon as a sufficient number of qualified candidates for the available space in each program—and for on-campus housing—have been admitted, admission into that program will be closed. After March, some well-qualified candidates may be denied entrance to the university or to their first-choice program. The general laws of supply and demand have a significant effect on the admissions process. As the interests of students change from time to time, enrollment pressures in different fields of study either increase or diminish.

The university requires each applicant to submit the record of prior schooling and the results of standardized test scores. Other information may be requested, and all information submitted will be considered. Every year, the university's *Admissions Viewbook* gives complete information and instructions, identifying the specific records and other information that must be submitted. The *Viewbook also* contains an application form. Those interested are invited to call to request a copy.

Application/Processing Fees
Reasonable nonrefundable application fees are charged as announced in the next section of this *Catalogue*.

The application fee may be waived upon demonstration of significant financial hardship. Secondary school students who are eligible for the College Board Admissions Testing Program's fee waiver should have their school counselors attach a copy of that waiver form to the UMass Dartmouth application. Transfer and "adult" applicants should support a written fee waiver request with a letter from a social worker, financial aid officer, or member of the clergy.

Applicant Types

Two Main Types: Freshman and Transfer Applicants
Applicants who will have secondary school or equivalency diplomas and who have never attended degree-granting post-secondary educational institutions are considered for **freshman** admission. Also considered for freshman admission are applicants who have successfully completed fewer than 15 semester credits of college study.

All who have attended degree-granting post-secondary educational institutions and completed 15 or more credits are considered **transfer** applicants.

Whether applying for freshman or transfer admission, those who completed secondary school at least three years prior to entering the university are not required to submit standardized test scores for admission. Approximately one quarter of our entering students are in this "Returning Students" category, and the admissions staff is available to advise applicants with any special circumstances. Returning Student applicants who would like to discuss their educational plans are encouraged to telephone to arrange an appointment.

Freshman Applicants for Early Decision
Those freshman applicants whose secondary school grades and SAT scores are strong, and who have decided that UMass Dartmouth is their first choice, may apply for Early Decision. They benefit by receiving a decision before the number of available spaces begins to decline; in return, once accepted they must submit a non-refundable deposit and withdraw all applications to other colleges or universities. For Early Decision consideration, the completed application form, school records through the end of the junior year, and official SAT scores (taken before the senior year), must be received by November 15; decisions will be mailed by December 15.

Alternative Admission for Academically Disadvantaged New Freshmen
The university realizes its commitment to equal access through alternative admission programs. Although they may not have met entrance standards in prior schooling or as expressed in performance on standardized tests, students in these programs do achieve levels of academic accomplishment comparable to those of other students at the university. The university is committed to the recruiting, counseling, and special academic services which have proven

effective in enabling these students to achieve their full potential.

Academically disadvantaged students who have the ability, desire, and motivation to benefit from the university's programs, but who lack qualifications for admission, can apply to enter UMass Dartmouth through the alternative admissions program, called **College Now**. Applicants must be in-state residents, cannot exceed 24 transferable college credits, and must meet at least one of the following eligibility criteria: low income status, limited English background, first generation to attend college, disability, or ethnic student of color status. College Now is a fall admissions program only. The *Admissions Viewbook* gives detailed instructions, and the program is described elsewhere in this *Catalogue*.

Some applicants interested in a scientific or technical major who lack the secondary-level preparation may be offered participation in the **Start Program** ("**S**teps **T**oward **A**bstract **R**easoning and **T**hinking"). Women and students of color, as groups traditionally under-represented in the scientific and technical fields, are eligible for this freshman-year program of special courses. Those who indicate a first-choice major in a science or engineering field are considered. The START curriculum helps its students acquire math, science, and reasoning skills in a special first year program of courses in mathematics, science concepts, and problem-solving.

Students admitted to these programs receive conditional admission to the university. To remain at the university after a stipulated trial period, they must satisfy conditions for academic performance and progress that are stated clearly in the offer of admission. They should expect to spend five years to complete the degree.

Early Admission for New Freshmen
Superior secondary school students sometimes exhaust the curricular offerings of their schools by the end of the junior year. These students may seek admission to UMass Dartmouth without a secondary school diploma. Their high school records and SAT scores must both be superior. They must also obtain from an official of their secondary school a written agreement that a secondary-level diploma will be granted upon satisfactory completion of one or two semesters of college work.

Dual Enrollment Program
UMass Dartmouth welcomes students from current secondary school interested in taking courses at the university under the Common-wealth's Dual Enrollment program, and qualified to do so. Because, currently, this program is not funded by legislation, UMass Dartmouth reserves the right to charge for the cost foof some or all of the courses taken. Students generally enroll in one or two courses, enrolling concurrently in high school and university courses. Students and parents should contact their high school guidance office or the Office of Admissions for assistance.

Secondary-Level Preparation: College-Preparatory Units
It is expected that an applicant's secondary school record will include at least 16 units of college preparatory courses:

- 4 units in English
- 2 units in social science including one in U.S. history
- 3 units in mathematics
- 2 units in the same foreign language
- 3 units in a science (two years with laboratory)
- 2 units of college-preparatory electives.

One or more of these requirements may be waived for applicants who present alternative indications of academic potential.

Secondary-Level Preparation: Program-Specific
Certain programs within the university require specific course backgrounds in addition to the general secondary-level requirements stated above. On the other hand, the Admissions Office will consider persons of extraordinary promise and talent for admission into a program even though they do not meet all of its prior-course requirements.

- *Chemistry, Computer Science, Engineering, Mathematics, Physics, and Textile Chemistry* require 3 and one-half units in college-preparatory mathematics which must include at least 2 units in algebra and one-half unit in trigonometry; and either (a) physics and chemistry, one of which must be a laboratory course, or (b) 3 units in natural science, one of which must be a laboratory course in physics or chemistry. Physics is strongly recommended for all engineering applicants.
- *Biology, Medical Laboratory Science, and Nursing* require 3 units of college-preparatory mathematics, which must include 2 units of algebra; and 2 units of natural laboratory science. Physics is strongly recommended for all engineering technology applicants and chemistry for all nursing and Medical Laboratory Science applicants.
- *Business* requires 3 units of college-preparatory mathematics, which must include 2 units of algebra.

•
Humanities and Social Sciences majors receive the degree of Bachelor of Arts. This degree requires that students satisfy a foreign language requirement. Therefore, we specifically consider the performance of our humanities and social sciences applicants in their secondary school foreign language courses.

College Board Scholastic Assessment Test (SAT) Results
The university uses SAT results as one means of assessing applicants' academic potential. The results of the ACT may be substituted.

The *Admissions Bulletin* gives full information about how to register and have score reports sent.

College Board Subject Achievement Tests are not required but the university urges applicants to submit these test results in appropriate subject matter areas. The achievement tests have significant predictive value, especially in the sciences, and can be a valuable source of data in the decision process.

Exceptions to the SAT Requirement
•
Applicants who have left high school three or more years ago (or who have completed 30 or more transferrable credits at a college or university) are not required to submit SAT scores.
•
Massachusetts residents who have been diagnosed as having a **learning disability** as determined by Chapter 766 or Chapter 344 may submit, *instead of* the SAT, proof of a diagnosis of a learning disability.

Applicants from a Second-Language Background
Sensitive to its location in an area of ethnic diversity, the university recognizes the barrier which the cultural and linguistic assumptions of standardized tests place between talented students for whom English is a second language and access to academic programs from which they can benefit. We will exempt students for whom English is a second language from those portions of our admissions standards which place them at a disadvantage.

Quality of Performance in Previous Schooling and on the SATs
For both freshman and transfer decisions, the evaluation of each applicant relies on an assessment of the *quality* of the applicant's previous school performance, test scores, abilities, and other aspects that are relevant to a prediction of probable success at the university. For each of the majors and curricula, somewhat different criteria are applied. The derivation of these criteria is the responsibility of the departments and colleges, in close cooperation with the representatives of the Admissions Office, who will implement the criteria in individual admissions decisions.

Information about the university's previous application decisions is routinely made available to secondary-school counselors. Applicants are encouraged to consult these officials at their institutions for advice about their prospects for admission to the university.

Some freshman applicants who are denied admission are advised by our admissions officials to pursue studies at a community college for one or more semesters and to reapply for admission. Subsequent admission is not automatic but conditional on good performance at the community college.

UMass Dartmouth welcomes transfer applications from students attending, or who have attended, public or private two- and four-year institutions. The university strives especially to facilitate the transfer of students from Massachusetts public community colleges through a variety of special contacts and communications. We accept the Commonwealth Transfer Compact.

Information about the university's previous application decisions is routinely made available to community college transfer officials. Applicants are encouraged to consult the officials at their institutions for advice about their prospects for admission to the university.

Some transfer applicants with few completed college credits who have been denied admission may be advised by our admissions officials to pursue studies at a community college for one or more semesters and then reapply for admission. Subsequent admission is not automatic but conditional on good performance at the community college.

Community College/UMass Dartmouth Joint Admission
The university offers access to a significant group of students through formal Joint Admission Agreements with all public community colleges in Massachusetts. The university also has agreements with the Community College of Rhode Island, Dean College, and Quincy College.

By the joint admission agreement, students entering a transfer degree program at the community college are admitted to UMass Dartmouth concurrently, being eligible to transfer after completion of the Associate's Degree, without making an additional application. Achievement of a 2.500 cumulative grade average, and remaining in the approved transfer program are the main conditions that the student must fulfill. The program involves active academic program planning and advisement by both college and university personnel, to assist students in meeting any requirements for the specific major program the student plans to enter at the university.

Prospective or current community college students should contact the UMass Dartmouth Admissions Office or an admissions officer or transfer counselor at the community college for further information.

Qualification for Admission: Transfer Applicants

In evaluating the qualifications of transfer applicants, procedures similar to those for freshman applicants are used in assessing the extent and levels of previous schooling and the quality of each applicant's performance. The exceptions are noted below. In general, secondary school records for transfer applicants who have completed relatively few college-level credits will be weighted more heavily than for those who have completed significant amounts of college-level work.

Records from Other Post-Secondary Institutions and Secondary-Level Records

Transfer students must arrange for certified transcripts to be sent to us from *all* colleges/universities that they have attended (including any for UMass Dartmouth's regular sessions and/or Division of Continuing Education). In addition, they must submit a listing of any courses in progress and course descriptions in some cases.

Transfer applicants who have completed 30 or more transferrable credits at a college or university are not required to submit secondary school records. Others must submit both secondary school and college transcripts. Those who completed high school through the GED program must send a copy of the GED certificate as well as the GED test scores in addition to the transcript of their last-attended school. Additional materials, such as teacher or counselor recommendations, are welcome. In specific cases, the admissions staff may ask for additional records.

College Board Scholastic Assessment Test (SAT) Results

Transfer applicants who present at least 30 transferrable college credits at the time of application are not required to submit College Board SAT results. Others are required to do so; most will submit the scores that they earned while they were in secondary school.

The *Admissions Viewbook* gives full information about how to register and to have score reports sent.

The Commonwealth Transfer Compact

The Transfer Compact offers special opportunities for students transferring from Massachusetts public community colleges to Massachusetts public colleges and universities. Specifically, the Compact is for students who will complete an associate's degree at the community college that is designed to prepare them to transfer to a four-year academic program. Students who have completed or will complete such a program are designated as Transfer Compact students by their community college.

UMass Dartmouth welcomes applications from Transfer Compact students with strong academic records. Among the advantages are a guaranteed acceptance of 60 credits in transfer, protections against having to repeat requirements (especially those for general education), and transferability of "D" grades. The complete text of the Transfer Compact is available at the community colleges, and a transfer counselor there should be able to provide guidance and explanations. It is also available from UMass Dartmouth, upon request.

We encourage those who are attending one of the Massachusetts public community colleges—even if they will not be Transfer Compact students—to plan their studies with eventual transfer to UMass Dartmouth in mind. The counseling or advising professionals at the student's community college can assist valuably in these plans.

Advanced Standing through Transfer Credits

The quality and quantity of academic work completed at previous higher education institutions determine the amount of transfer credit accepted at UMass Dartmouth and its applicability toward a degree. We accept college/university level credits taken at an accredited institution if the content is equivalent to a course or appropriate to a curriculum that we offer. Vocational or non-college level courses (such as physical activity, trade education, and high-school level courses) are not transferable.

The university's basic course and credit transfer policies are stated as follows. These policies apply unless a special transfer agreement or program imposes different conditions approved for that program. Special conditions apply for Interchange Transfer students, students entering under the Transfer Compact, and students in Study on Exchange status.

Transferred credits and course titles will be recorded on the transcript, without a grade designation; they will not be included in the grade point average that is earned here. Only credits for courses in which "C-" or higher grades were received will transfer.

At least 45 credits of course work must be completed at UMass Dartmouth. Other credits that may be applied to the degree include advanced placement and CLEP credits. No more than 60 credits can be accepted from any combination of post-secondary 2-year institutions, advanced placement, or CLEP credits.

At least 30 credits of advanced and specialized courses must be completed (UMass Dartmouth courses numbered 300 or higher). It is expected that students will earn most of their advanced and specialized course credits at UMass Dartmouth. Students may be granted permission by the appropriate chairperson and college dean to earn some of these credits at another institution so long as UMass Dartmouth major and minor requirements are met to their satisfaction thereby.

All courses accepted for transfer credit will count as UMass Dartmouth credits, but they will not necessarily count toward the specific degree requirements of the candidate's college and department. Some may be awarded as free electives only. Transcripts are evaluated by the Admission Office or the college into which the applicant is accepted.

Interchange Transfer, Permanent

Currently enrolled degree-seeking students at UMass Amherst, UMass Boston, or UMass Lowell who wish to change to be degree-seeking students at UMass Dartmouth may request Interchange Transfer. No application fee is required. To be eligible, the applicant must be in good academic standing and be currently enrolled with a load of 12 or more credits, have completed successfully at least 12 credits, and have at least a 2.000 cumulative grade point average.

Interchange transfer applicants must submit our application form and have an official copy of their *current* UMass transcript sent to us; if they meet the eligibility criteria, no other documents need to be sent.

Part-time, continuing-education, or non-degree "special students" at a UMass campus are considered regular applicants and must submit all documentation and pay the application fee.

more on next page

Transfer applicants
continued

Please contact the UMass Dartmouth Office of Admissions for specific instructions.

Temporary Interchange Transfer
Temporary interchange students from the other campuses attend UMass Dartmouth for one or two semesters, applying UMass Dartmouth credits to the degree requirements of their home campus.

Before registering, temporary interchange students should receive from their home campus all necessary approvals regarding the applicability of UMass Dartmouth courses to the degree requirements of their home campus. Temporary interchange students receiving financial aid work through the financial aid office at their home campus.

Other Types of Credit

Applicants have opportunities for academic credit in addition to that provided by the transfer of credits from other institutions of higher learning.

AP examinations. Increasing numbers of students complete college-level studies while still in secondary school, through the Advanced Placement program of the College Board. We award advanced placement and/or college credit for AP examination scores of 3 or higher (with one exception: Psychology requires a 4 or 5) in most AP fields. Additional information is available at the Office of Admissions.

CLEP credit. The university has approved the use of the College Board College Level Examination Program (CLEP). This program uses test results to show that an individual has achieved college-level education in a certain academic field. We can award credit for CLEP Subject Examination scores of 50 or above, as reported on the CLEP score report. Some CLEP Subject Examinations may not receive credit, and the equivalency of these to UMass Dartmouth's courses will be determined by the academic department for that subject. UMass Dartmouth does not give credit for CLEP General Examinations. Please consult the more detailed statement in the chapter on Special Learning Opportunities.

Military training courses. For military service school training, credit will be evaluated according to the recommendations of the *Guide to the Evaluation of Educational Experience in the Armed Services*, prepared by the American Council on Education. Degree candidates normally do not use these credits within the major field.

Continuing Education degree offerings; prior learning credit. The Division of Continuing Education at UMass Dartmouth offers credit for validated prior learning to those who have become registered students. This program provides university academic credit for adult students who, through occupational or other experiences, have achieved the equivalent of college-level knowledge. Their prior learning is documented through a one-semester workshop and then evaluated for credit.

Credit courses taken from UMass Dartmouth's Division of Continuing Education are considered regular courses of the university. They appear on the transcript and the grades earned are reflected in the candidate's grade point average at the university.

Additional Application Requirements

The nature of some majors or curricula may make it desirable for additional information to be gathered systematically as a part of the application process so long as they do not contradict the admissions policies and procedures of the university. Three such requirements are currently in effect.

Multidisciplinary Studies
Applicants for admission to this individually-designed major must arrange a program of study with the program director before acceptance can be offered. This program is open to transfer applicants only.

Music Audition Requirement
Applicants for admission to the music major must audition in person in their principal applied area (either instrument or voice); the audition is a requirement for a completed application in music. Those who cannot audition in person must request permission to submit recordings.

Studio Art Portfolio
The faculty of the College of Visual and Performing Arts review applicants' art portfolios as a part of the application process. Complete instructions to help applicants meet these requirements are given in the *Admissions Viewbook*.

Nursing, RN Track
Matriculation in this program requires a student to have a nursing associate's degree or hospital diploma and a current Massachusetts RN license.

Regional Student Admission: Reduced Tuition Program

The New England Regional Student Program enables residents of Rhode Island, Connecticut, Maine, New Hampshire, and Vermont who apply for academic programs not available in their own public colleges and universities to receive special consideration for admission and to pay significantly reduced tuition at this university (in-state tuition plus 50%). Secondary school guidance counselors and college transfer officers can provide details about this program, or one can contact the New England Board of Higher Education, Boston, MA 01984, phone (617) 357-9620. The following table indicates UMass Dartmouth undergraduate programs that are available to New England residents at reduced tuition charges:

Program	Eligible State Residents
Textile Chemistry	CT, ME, NH, RI, VT
Textile Science	CT, ME, NH, RI, VT
Portuguese	ME, NH, RI, VT
Sculpture/3D	CT, ME, NH, RI, VT
Textile Design	CT, ME, NH, RI, VT
Visual Design	ME, RI, VT
Art Education	RI

Other Applicant Types

International Applicants
(those needing to receive F-1 visas)
To the extent possible, international applicants should follow the instructions for either new freshman or transfer application, depending on their individual circumstances. International applicants will pay the out-of-state application fee and are not eligible for waivers of this fee. Upon acceptance and for as long as they attend the university, they must pay out-of-state tuition. International undergraduate students are not eligible to receive financial aid from the university.

International applicants must submit their application fees in US currency. Checks not in US currency will be returned and the application will not be processed until the fee has been resubmitted in US currency.

These applicants must also meet all requirements of the United States Office of Immigration, in order to be issued the I-20 form. They must satisfy the conditions for admission to the university and become full-time, degree-seeking students.

In addition, international applicants whose native language is other than English must submit official scores from the Test of English as a Foreign Language (TOEFL), which is offered at regularly scheduled intervals throughout the world. Foreign nationals who have completed a year or more of study in United States institutions, or whose education abroad was conducted in institutions in which the primary language of instruction is English, are exempt from this requirement.

Students Seeking a Second Bachelor's Degree
Students who have earned a bachelor's degree at UMass Dartmouth or a predecessor institution who wish to pursue a second baccalaureate degree here, are invited to apply for readmission at the Registrar's Office. Those with a degree from another institution apply to the Admissions Office.

UMass Dartmouth Students Seeking Re-Admission
Any student who was previously admitted to UMass Dartmouth (day division) as a degree candidate and who registered for one or more semesters may request re-admission by contacting the Registrar's Office at (508) 999-8615.

Access to Courses, for Students Not Seeking a Degree (Non-Degree Students)
There are many reasons why a person might wish to take one or more courses at the university without seeking a degree. When feasible, therefore, we allow qualified students who are not UMass Dartmouth degree candidates to register for courses as special students. They may register only for courses for which they are qualified and in which space is available after the degree-seeking students have registered, and will be held to a strict limit in the total number of credits for which they may enroll as special students. Specific regulations for special students are given in the Academic Policies and Regulations section of this *Catalogue*.

Non-Degree Student registration may take place after the close of registration for degree students. An initial review of those seeking to register as undergraduate non-degree students is made in the Academic Advising Center. Applicants should be prepared to discuss their plans and to show appropriate records of prior schooling.

Visiting and Exchange Students
The university welcomes visiting students, who are matriculated at another university or college but wish to pursue their studies with us temporarily. We are especially interested in supporting students whose studies at another university will be enriched by a planned semester here, arranged between academic departments or faculty advisors.

The university also participates in formal as well as informal international student exchanges. A listing of formal exchange programs appears elsewhere in this catalogue. Contact the director of any of the exchange programs for additional information about the programs. Students accepted in exchange are issued paperwork authorizing them to receive a J-1 student visa, through the Office of Academic Affairs/ Graduate Studies (508-999-8024).

Students with Disabilities
Applicants are under no obligation to disclose a disability. The university will admit students who clearly demonstrate the ability to perform the academic work, without reference to learning or physical disability, as with all applicants.

Students with a physical or learning disability who are offered admission are encouraged to contact us about the support services we offer, to help them make their decision whether to enroll. An early meeting with Carole Johnson, Director of the Office of Disabled Student Services, is recommended; call (508) 999-8711. Students considering application may also call this office; the admission decision will be made independently of such preliminary inquiries.

Mid-Year Admissions
To the extent that space and fiscal resources permit, the university will admit qualified mid-year applicants. Special efforts will be made to ensure that spaces are available in appropriate spring semester classes for those admitted.

Social Security Number
The university requests all students (except international students who lack them) to submit their social security numbers for use as their student ID number. However, those who do not wish to have their social security numbers used as their student identifier will be issued a special nine-digit number for this purpose, upon formal request to the Office of the University Registrar. Students can be assured that the university will respect and protect their privacy and their social security numbers.

Graduate Admissions
Contact the Office of Graduate Studies for information, program descriptions, and application materials. Phone (508) 999-8604.

Expenses and Student Financial Services

The cost to students of an education at a public university remains one of the great bargains of our time. While there have been increases in recent years, the charges are still very affordable, especially when one considers the high quality of the education offered. Tuition and fees cover a part of the costs, but the remainder is made available by the taxpayers of the Commonwealth. The result is a creative partnership between the individual students and their families and the members of an enlightened democracy, which believes that the economic, political, and cultural success of the society depends on a well-educated citizenry.

Undergraduate and graduate students at the university pay tuition and various fees. In addition, they will have costs for textbooks and other incidentals and for meals and housing. This section gives information about the structure of charges at the university, focusing specifically on charges to undergraduate students. It is intended to assist students and their families in their financial planning.

More detailed information on graduate student charges is available in the Graduate Catalogue (from the Office of Graduate Studies).

The university provides comprehensive financial aid and related services. Applicants and current students are invited to inquire about the aid and scholarship opportunities that are described later in this chapter.

Disclaimer:
Currency of Information
In preparing this *Catalogue*, we have made every effort to give the most up-to-date information possible. However, changes in tuition and fees may occur after the book has been printed. An exact schedule of all current charges is available from the Office of the Bursar, Foster Administration Building, second floor, or the University Enrollment Center, first floor.

All expenses are subject to change at the discretion of the Commonwealth, the Board of Higher Education, or the University. Similarly subject to change may be various policies associated with charges.

Payment Policy
Students may pay all tuition, fee, room, and board payments by mail, or at the University Enrollment Center, first floor of the Foster Administration building, hours are Monday through Thursday, 8 a.m. to 7 p.m., and Friday, 8 a.m. to 5 p.m. Credit cards (Master Card, Visa, and Discover) are accepted.

All charges are due and payable at a date set by UMass Dartmouth (usually August 20 and January 5). Payments received after the due date indicated will be charged a late fee. The University mails bills to the student's permanent address; students must take care that they list an appropriate permanent address, for this reason.

Students are expected to keep their accounts current and to pay their financial obligations to the university. Students may not attend classes until all charges have been paid, or vouched for. In appropriate circumstances, the Bursar's Office may impose various restrictions in order to enforce payment of an obligation, including withholding of official transcripts and the diploma. The Vice Chancellor for Fiscal Affairs/designee hears appeals of difficult cases.

Policies Affecting Charges

As a state-supported institution, UMass Dartmouth's programs and facilities are available at reasonable tuition rates to residents of the Commonwealth of Massachusetts.

The table to the right shows tuition and fee charges for the 2003-2004 academic year.

Residency: Massachusetts state residents pay a considerably reduced tuition and curriculum fee charge over that paid by out-of-state residents. Under the New England Board of Higher Education's Regional Student Program, residents of other states in New England are eligible for reduced out-of-state tuition for some academic programs not available in their own state. Later in this section we give additional information about the tuition/fee residency policies.

Prorating by credit load: Students pay the full amount for tuition and mandatory fees if taking twelve or more credits. Charges for those taking fewer than twelve credits are prorated evenly by the number of course credits. A table at the end of this chapter shows the per-credit/per-semester charges in effect for the 2003-2004 academic year.

Charges by type of study: Degree students, non-degree students, and students auditing a course or courses pay the same academic charges.

The *Division of Continuing Education* offers courses under a structure of charges different from that presented in this catalogue.

Tuition and Mandatory Fees

Tuition
Tuition charges are established annually by the Board of Higher Education of the Commonwealth of Massachusetts.

Mandatory Fees
In addition to **tuition**, all students pay the following mandatory fees:

All students are assessed a **curriculum support fee**, which is calculated by a different rate depending on state residency. This fee supports the full program of academic and student services of the university, and functions similarly to tuition in supporting overall activities of the institution.

The **athletics fee** supports the men's and women's athletic programs. The **student fee** supports student publications, the student radio station, and various other student related activities. These fees are determined by the students themselves, through the student governance process. (Note that these two fees represent a division of the previous single fee called the "general fee.")

The **campus center fee** is used to support the programming activities and general administrative expenses of the Campus Center. A Board of Governors, composed of 13 students, one alumnus, and two administrators, oversees the operation.

The **health fee** supports on-campus health services, available to all students.

The **MassPIRG fee**, imposed by student vote, is charged each semester. It supports the activities of the Massachusetts Public Interest Research Group, and is waivable upon request.

Refunds — Withdrawal from School

A student who registers and commences studies but then withdraws officially from UMass Dartmouth for any reason during an academic semester will be granted a refund according to the refund schedule given later in this section. A student who remits, in advance, a payment of tuition and fees but then does not subsequently register and

Summary of Annual Expenses
2003-2004

Excluding Room and Board
(and *excluding* individual and onetime expenses)

	Undergraduates	Graduates
Massachusetts Residents		
Tuition	1,417	2,071
Curriculum Support Fee	4,220	4,704
Athletics Fee	185	185
Student Fee	125	125
Campus Center Fee	150	150
Health Fee	32	32
Total	**6,129**	**7,267**

Non-Massachusetts Residents		
Tuition	8,099	8,099
Curriculum Support Fee	7,038	7,038
Athletics Fee	185	185
Student Fee	125	125
Campus Center Fee	150	150
Health Fee	32	32
Total	**15,629**	**15,629**

Regional Student Program Non-Residents		
Tuition	2,126	3,107
Curriculum Support Fee	5,629	5,8711
Athletics Fee	185	185
Student Fee	125	125
Campus Center Fee	150	150
Health Fee	32	32
Total	**8,247**	**9,470**

All tuition and fee cost figures are based on enrollment in 12 or more credits each semester.

$600 additional for books and supplies is typical, although different subjects of study have considerable variation. Additional charges also occur through college, department, or course-specific fees.

Including Room and Board
(and *excluding* individual and onetime expenses)

	Undergraduates	Graduates
Massachusetts Residents		
Tuition	1,417	2,071
Curriculum Support Fee	4,220	4,704
Athletics Fee	185	185
Student Fee	125	125
Campus Center Fee	150	150
Health Fee	32	32
Room (and Board)	*6,706 / **4,881	
Total	**12,835**	**12,148**

Non-Massachusetts Residents		
Tuition	8,099	8,099
Curriculum Support Fee	7,038	7,038
Athletics Fee	185	185
Student Fee	125	125
Campus Center Fee	150	150
Health Fee	32	32
Room (and Board)	*6,706 / **4,881	
Total	**22,335**	**20,510**

Regional Student Program Non-Residents		
Tuition	2,126	3,107
Curriculum Support Fee	5,629	5,871
Athletics Fee	185	185
Student Fee	125	125
Campus Center Fee	150	150
Health Fee	32	32
Room (and Board)	*6,706 / **4,881	
Total	**14,953**	**14,351**

*Dormitory plus the 12-meal plan, the one most commonly selected. See table of meal plans below for choices we offer.

**Cedar Dell Apartments: Advanced undergraduate housing is in the Cedar Dell Student Apartments, the cost for which does not include meals.

attend will be given full refund of tuition and fees.

All refunds are based on official withdrawal notices as dated and processed by the Office of the University Registrar and then forwarded to the Bursar's Office.

Health Insurance

Students enrolled in a 3/4 time load or higher (9 credits for undergraduate students) are required by state law to be covered by appropriate health insurance. The university provides this insurance and charges a health insurance fee to cover its cost, unless students are already covered by an appropriate insurance program. This fee is waived if the student presents proof of appropriate insurance coverage, to the Bursar's Office or University Enrollment Center. This insurance coverage must meet the Qualifying Student Health Insurance Program guideline and be billable in the local UMass Dartmouth area.

The fee covers the cost of enrollment in a program for group health insurance coverage that has been negotiated by the university. Students enrolling in this plan receive full disclosure of the benefits they will receive. Detailed information is available at the Student Health Office. Students enrolled in less than a 3/4-time load are not eligible for this insurance.

International students on a student visa will automatically be enrolled in the UMass Dartmouth Qualifying Student Health Insurance plan. By regulations of the Commonwealth of Massachusetts pre-existing coverage or coverage from other plans may not be substituted for the UMass-sponsored plan for international students.

New England Regional Student Program

The university is a member of the New England Regional Student Program. Under this program students from other New England states may receive tuition benefits if a similar program is not available in their home state.

Eligible programs for 2002-2003 and the schedule of charges are given in tables accompanying the chapter on Admissions.

For more information, contact the Office of the Regional Student Program, New England Board of Higher Education, 45 Temple Place, Boston, MA 02111; phone 617 357-9620.

Tuition/Fee Waivers for Special Groups

Those in certain classifications may receive waivers of tuition or fees, some of which are listed here. If you believe you are a member of a group eligible for a waiver, please consult the University Enrollment Center or Bursar's Office.

Students **sixty years of age or over** who are Massachusetts residents are exempt from tuition and mandatory fee charges. Applications for tuition and fee exemption may be obtained from the Bursar's Office or University Enrollment Center.

Some categories of **state workers** may receive waivers of tuition charges, but not of fees. Some categories of **veterans** may receive waivers of tuition, but not of fees.

Program- and Course-Specific Fees

Specific fee amounts are shown in an accompanying table. Beginning in the 2001-2002 academic year, there is a restructuring of fees. Previously, students registered in certain courses were required to pay Studio/Lab fees (called S/LA fees), which ranged from $11 to $60 but were higher for a few courses. Now, these course-by-course fees have been consolidated into semester fees charged by the students' college or major program. These fees cover costs directly associated with the delivery of instruction, for example, providing supplies and equipment for scientific laboratories, equipment for instructional computing, and art studio supplies.

Engineering Equipment Fee. Students in majors in the College of Engineering will be charged a special fee each semester, to assist with the costs of laboratory equipment. This fee now also covers fee payments that were previously assessed as SLA fees.

Nursing Instructional Fee. Students in majors in the College of Nursing will be charged a special instructional fee each semester. This fee now also covers fee payments that were previously assessed as SLA fees. Students registered in **clinical nursing** courses must have liability insurance, which they arrange separately from the university.

Business Administration Fee. Students in majors in the Charlton College of Business will be charged a special fee each semester, to assist with equipment and other instructional costs.

CVPA Specialized Course Support Fee. Students in majors in the College of Visual and Performing Arts will be charged a special fee each semester.

College of Arts and Sciences—Level 1 Program Fee. Students in majors in the Humanities and Social Sciences and Interdisciplinary programs in the College of Arts and Sciences will be charged a special fee to assist with equipment and other instructional costs.

College of Arts and Sciences—Level 2 Program Fee. Students in majors in the Sciences in the College of Arts and Sciences will be charged a special fee to assist with equipment and other instructional costs.

School of Marine Science and Technology Program Fee— Students in the School of Marine Science and Technology will be charged a special fee to assist with equipment and other instructional costs.

Applied Music Course Fee. Applied music courses require payment of a course fee in addition to other tuition and fees. The fee is charged for every registration in one of these courses, except that Music majors may take one applied music course each semester without this fee. Applied Music courses are identified in the Music Department section of this catalogue and specific charges are shown in an accompanying table in this chapter.

One-Time Fees

Specific fee amounts are shown in an accompanying table.

Application Fee. Applicants are charged a non-refundable, non-waivable application fee. Massachusetts and Non-Massachusetts residents pay different application amounts.

Admissions Deposits. Students who have been accepted for admission to the university must reserve a space in the entering class by submitting an admissions fee deposit. Admitted applicants are given until a stated deadline to submit the deposit, after which date the space reserved for them will be given to another candidate.

Prospective students who have a hardship associated with this deadline may discuss that situation with the Director of Admissions. This fee will be applied towards tuition, upon registration. Complete instructions are given along with the letter of admission. Similarly, a housing reservation deposit is charged. This fee will be applied to the student's housing bill, upon registration.

Orientation Fee. An Orientation Fee is paid by all incoming freshman, transfer, and international students (all levels) to help defray the expenses of the New Student Orientation Program. Freshmen attend a two-day, overnight program, and transfer students attend a day-long program.

Transcript Fee. Paid the first semester one is in attendance as a degree student, this fee provides life-time transcripts at no charge and supports availability of advising transcripts.

Withdrawn on Exchange Fee. Students pay a small fee in order to remain in active status at the university while engaging in an educational activity under the university's sponsorship but at a different location, such as study abroad.

Program Continuation Fee. This fee allows graduate students who require a semester or more to complete a project, thesis, or dissertation but who have completed course requirements to register, for a charge well below that for a three-credit course. This fee can also be used to bridge across a semester or more of absence from course registration when a graduate student remains active as a candidate for the degree.

Readmission Fee. Applicants for readmission are charged a readmission fee. The fee, which covers costs associated with processing the application, is to be paid before the student's file is forwarded to the department for consideration. Policies regarding readmission and leave of absence are covered in the chapter on Academic Regulations and Procedures.

Graduation Fee. Students pay this fee in their last semester prior to receiving a degree to help defray costs associated with graduation and commencement. An additional portion provides a one-year membership in the Alumni Association. A refund of the Alumni Association membership fee portion may be obtained by those not wishing to participate, if application is made to the Bursar or the University Enrollment Center.

Payment Financing

The university makes available the services of private financing programs to assist those students who wish to spread their tuition and fee payments out rather than paying the entire amount at the beginning of the term. Information and application forms are available from the Bursar or the University Enrollment Center.

Books and Supplies

Costs for books and supplies vary with the habits of the individual as well as with the nature of each student's academic program. The following information may provide a general guideline, for planning.

$600 per year for books and supplies is an estimated or typical amount. Generally, books cost more in the scientific and technical fields. First year Engineering students have additional expenses for engineering drawing equipment and related materials. Students in the College of Visual and Performing Arts will incur some additional expenses for art supplies.

Students registered in clinical nursing courses have an additional expense for uniforms and for insurance. Medical Laboratory Science seniors have additional expenses for uniforms and lab coats, malpractice insurance, and commuting to participating hospitals. They are also responsible for providing their own transportation for clinical practice.

Residency Requirements for Tuition and the Curriculum Support Fee

Massachusetts "resident students" pay in-state tuition and fee charges. Others pay out-of-state charges. Certain non-Massachusetts students—in specified programs only and residents of specified New England states—receive a substantial reduction of the non-resident tuition charge through the New England Regional Student Program.

The full regulations on determining residency are included at the end of this chapter; what follows is a brief overview.

To be deemed a Massachusetts resident, one must have had a legal domicile in the state for at least one year before the commencement of the academic semester, residing in the state for purposes other than attending an educational institution (or one's parents, if one is financially dependent on them). Those who do not meet the conditions are considered out-of-state or non-resident students. A student at a certain degree level, e.g., undergraduate, may retain in-state residency during continuous attendance at the institution, until attainment of the degree for which enrolled.

Students whose situation changes may request a determination of in-state residency by filing the residency reclassification form and submitting appropriate documentation. A similar process is used to contest an initial residency determination. Appeals are heard by a campus Residency Appeal Committee, which makes the final residency determination. Questions on residency policies, and requests for reconsideration and the appeals process, are handled by Chris Kaylor, Office of University Records, phone 508 999-8620.

Any student who undertakes university study under a non-resident temporary student visa (having been issued a form I-20 or IAP-66 by us) must pay the out-of-state rate for application fee and tuition charges. This remains in force for the duration of the student's attendance at the University of Massachusetts Dartmouth for as long as the individual remains an international student on a non-resident visa.

Room and Board Charges

Students of the university who live on-campus are offered a number of plans. Specifics of what each plan provides are available from the Office of Housing and Residential Life, and are summarized in the chapter on the Campus Experience. Further details and instructions for reserving a space are mailed to every applicant who has been accepted for housing. The costs for the different plans are listed in an accompanying table.

Charges Per Credit per Semester

2003-2004 Rates

At 12 credits the charge will be at a maximum. Credits above 12 are added at no additional charge. The charges shown here do not include non-mandatory fees, course/college fees, housing, books/supplies, or personal expenses.

	Undergrad.	Grad.
Massachusetts Residents		
Tuition	59.04	86.29
Curriculum Support Fee	175.83	196.00
Athletics Fee	7.71	7.71
Student Fee	5.21	5.21
Campus Center Fee	6.25	6.25
Health Fee	1.33	1.33
Total	**255.37**	**302.79**
Non-Massachusetts Residents		
Tuition	337.46	337.46
Curriculum Support Fee	293.25	293.25
Athletics Fee	7.71	7.71
Student Fee	5.21	5.21
Campus Center Fee	6.25	6.25
Health Fee	1.33	1.33
Total	**651.21**	**651.21**
Regional Student Program		
Tuition	88.56	129.44
Curriculum Support Fee	234.54	244.62
Athletics Fee	7.71	7.71
Student Fee	5.21	5.21
Campus Center Fee	6.25	6.25
Health Fee	1.33	1.33
Total	**343.60**	**394.56**

Annual Campus Housing Charges

(2003-2004 charges shown)

Double room, 19 meal plan	7,099
Double room ,16 meal flex plan	7,012
Double room, 12 meal flex plan	6,706
Double room, 7 meal flex plan	6,586
Single room, additional	215
Cedar Dell Apartment, Single room	4,881
Telephone charge (mandatory)	244
Housing reservation deposit	200
New Dorms	4,745
"A" Room (Triple Premium)	4,246

Refund of charges for on-campus meals and housing is governed by the terms of the housing contract.

One-Time and Individual Fees and Charges, 2003-2004 Rates

Application Fee	
Massachusetts residents	35
Non-Massachusetts residents	55
Admissions Deposit	
(applied toward tuition upon matriculation)	150
Transcript fee (one-time payment, all degree students)	50
New ID card/Replacement ID Card	25/15
Readmission Fee	25
Withdrawn on Exchange Fee	25 /semester
Withdrawn on Exchange Fee (Co-op Students)	100 /semester
Program Continuation Fee	90 /semester
Mass-PIRG Fee (waiveable)	7 /semester
Health Insurance Plan	943 /year
	592 /spring, summer
Engineering Equipment Fee	240 /semester
Nursing Instructional Fee	200 /semester
Business Administration Fee	70 /semester
College of Arts and Science—Level 1 Program Fee	70 /semester
College of Arts and Science—Level 2 Program Fee (Sciences)	100 /semester
CVPA Specialized Course Support Fee	190 /semester
SMAST Program Fee	100 /semester
Applied Music Course Fee	
Individual	400 /semester
Group	100 /semester
Orientation Fee	
New freshmen	200
New transfers	125
New international students (all levels including graduate)	200
Graduation Fee	
For commencement costs	100
Alumni Association one-year membership (refundable)	20

Refund Schedule

A student who registers and commences studies but then withdraws officially from UMass Dartmouth for any reason during an academic semester will be granted a refund according to the refund schedule given on the following page. A student who remits, in advance, a payment of tuition and fees but then does not subsequently register and attend will be given full refund of tuition and fees. All refunds are based on official withdrawal notices as dated and processed by the Office of the University Registrar and then forwarded to the Bursar's Office.

Percentage and type of refund, upon Official Withdrawal from UMass Dartmouth

Prior to first day and through to end of publicized drop/add period each semester	100% tuition and all fees
During second week (next 5 class days)	90% tuition and curriculum support fee
During third week (next 5 class days)	70% tuition and curriculum support fee
During fourth week (next 5 class days)	50% tuition and curriculum support fee
After fourth week	No refund of charges

"Official Withdrawal" is defined in the chapter on Academic Regulations and Procedures, applying to the regular courses of the university. The Division of Continuing Education has a separate fee schedule, billing process, and refund schedule.

One-time fees, such as the application, orientation fees, and college fees are not refunded.

Financial Aid Services

Nearly all students are eligible for some type of financial assistance.

Financial Aid Services is located at 105 Foster Administration Building and welcomes inquiries from current and prospective students and their families. They conduct many financial aid presentations both on and off-campus each year to assist university applicants and the community.

If students experience unforeseen financial difficulties at any time or have questions concerning financial aid, they should contact the University Enrollment Center or Financial Aid Services, Foster Administration Building, x8632.

UMass Dartmouth awards financial aid based upon federal, state, and institutional guidelines, and determines eligibility by using the *Free Application for Federal Student Aid* (FAFSA). Financial assistance may be available in the form of need-based grants, scholarships, loans and work-study programs. Non need-based loans are also available to students and families who do not qualify for need-based aid.

The eligibility for a need-based financial aid award is based on each individual applicant's financial need, which is determined in the financial aid application process. Both the amount and the type of aid awarded are related to the financial needs and circumstances of the individual and the timeliness of the FAFSA form.

Financial Aid Services is committed to helping applicants and students with all phases of the aid application and award process. The office provides much guidance in helping applicants through the steps in the process, however, it is the responsibility of the student who desires aid to obtain the necessary forms and instructions from Financial Aid Services and to fill out all required forms accurately and to supply all necessary information and to meet all applicable deadlines.

Application Process

Application for all need-based aid programs is made by completing the Free Application for Federal Student Aid (FAFSA). Certain non-need parent and student loans also require submission of the FAFSA.

Early application is strongly encouraged. **The priority filing date is for FAFSA materials to be received at the Federal processor by March 1st** before the year for which aid is sought, with UMass Dartmouth included in the list of schools. The UMass Dartmouth Title IV school code is **002210**. We recommend mailing your FAFSA by February 15th to ensure priority consideration.

Students must be admitted to a degree program before eligibility can be determined for financial aid. Graduate students and second-degree students are not eligible for federal or state grant programs. Students enrolling in study away or overseas study may receive limited funding, if the studies are integral to their degree program. Students enrolling for less than full-time may receive limited funding.

Students receiving need-based financial assistance are subject to **requirements for academic progress and performance** in the continuation of their studies. These standards are outlined in the Academic Regulations and Procedures section of this *Catalogue*, and full information about the process and its conditions is available in Financial Aid Services.

Financial Aid Services Office

The Financial Aid Services Office offers a complete range of grants, loans, and student employment opportunities. The Financial Aid Services Office serves as a clearinghouse for Federal, state, and institutional sources of financial assistance. The Financial Aid Services Office also assists students in researching scholarship resources as well as alternative loans and payments plans.

Scholarships

The university offers many private and foundation scholarships, which originate from a variety of sources. A listing of the scholarship opportunities is accessible from the UMass Dartmouth web home page. Included are both merit-based and need-based scholarships, which are often targeted for particular types of students.

In addition, other merit-based scholarships are offered competitively to entering freshman and transfer students on the basis of academic achievement and evidence of intellectual and personal creativity. Information about this program is available from the Office of Admissions.

Student Employment

Students at the university can contribute toward their college expenses and gain valuable work experience through many varieties of student employment. Many students have work allotted through federal college work-study awarded as a part of financial aid. In addition, however, many others find campus jobs regardless of whether they have demonstrated a financial need or received an aid award. Furthermore, others seek part-time or summer work off campus, and the university assists them in learning of such opportunities.

Students who are awarded federal work-study through the financial aid process receive the necessary support to obtain their actual work-study assignment from Career Resources. A Federal work-study award is an indicator only of eligibility to apply for a work-study job, not a guarantee of employment. Information sessions held during the summer and into the fall semester give the information students need to make the most of their college work-study experience. Many kinds of on-campus work-study assignments are available, and off-campus work-study is also available through the Community Service Learning Program.

Non-work-study employment is also found at the Office for Student Employment. The Student Employment Directory lists positions with various campus organizations and departments, and the office staff assists students in matching their interests and qualifications to the available positions. The office also maintains a listing of off-campus part-time work and summer jobs, posting vacancies on bulletin boards in the office and, along with full-time opportunities, publishing announcements in the weekly JobTrakker Bulletin.

Regulations Governing Residency for Tuition Purposes

These rules and regulations, approved by the University's Board of Trustees, are current as of publication. They apply to the classification of students at the University of Massachusetts as Massachusetts or non-Massachusetts students for tuition and fee purposes. They apply both to degree and non-degree students.

Part 1. Definitions

1.1 "Academic period" shall mean a term or semester in an academic year or a summer session, as prescribed by the Board of Trustees or under their authority.

1.2 "Continuous attendance" shall mean enrollment at the University for the normal academic year in each calendar year, or the appropriate portion or portions of such academic year as prescribed by the Board of Trustees or under their authority.

1.3 "Emancipated person," for the purposes of residency classification for tuition, shall mean a person who has attained the age of 18 years *and* is financially independent of his or her parents, or if under 18 years of age (a) whose parents have entirely surrendered the right to the care, custody, and earnings of such person and who no longer are under any legal obligation to support or maintain such person; or (b) a person who is legally married, or (c) a person who has no parent. If none of the aforesaid definitions apply, said person shall be deemed an "unemancipated person."

1.4 "Parent" shall mean

a) the person's father and mother, jointly;

b) if the person's father is deceased the person's mother; if the person's mother is deceased, the person's father;

c) if a legal guardian has been appointed by a court having jurisdiction, the legal guardian;

d) if neither the father nor mother is living and no legal guardian has been appointed, the person who then stands *in loco parentis* to the person;

e) if the father and mother are divorced, separated or unmarried, the parent who has been awarded legal custody of the person; or if legal custody has not been awarded, the parent with whom the person lives. With respect to any adopted student, the word "adoptive" should be inserted before the words "father" and "mother" wherever used.

1.5 "Reside," "residency," or "resident" shall mean "domicile," i.e., a person's true, fixed and permanent home or place of habitation, where he or she intends to remain permanently.

Part II. Classification

2.1 For the purpose of assessing tuition and fees, each student shall be classified as a "Massachusetts resident" or a "non-Massachusetts resident." A person shall be classified as a Massachusetts resident if he or she (or the parent of an unemancipated student) shall have resided in the Commonwealth of Massachusetts for purposes other than attending an educational institution for twelve months immediately preceding the student's entry or reentry as a student.

Physical presence for this entire twelve-month period need not be required as long as the conduct of an individual, taken in total, manifests an intention to make Massachusetts his or her permanent dwelling place.

Part III. Determination of Residency

3.1 Proof of Residency

a) Each case will be decided on the basis of all facts submitted with qualitative rather than quantitative emphasis. A number of factors is required for residency to determine the intention of the person to maintain permanent residence in Massachusetts. No single index is decisive. The burden of proof rests on the student seeking classification as a Massachusetts resident.

b) The following shall be primary indicia of residency:

1) For an unemancipated person, the residency of parents, having custody, within Massachusetts;

2) Certified copies of federal and state income tax returns;

3) Permanent employment in a position not normally filled by a student;

4) Reliance on Massachusetts sources for financial support;

5) Former residency in Massachusetts and maintenance of significant connections there while absent.

c) The following shall be secondary indicia of residence, to be considered of less weight than the indicia listed above in subsection b):

1) Continuous physical presence in Massachusetts during periods when not an enrolled student;

2) Military home of record;

3) All other material of whatever kind or source which may have a bearing ondetermining residency.

3.2 Proof of Emancipation. A student asserting that he or she is an emancipated person shall furnish evidence to support such assertion. Such evidence may include:

a) Birth certificate or any other legal document that shows place and date of birth;

b) Legal guardianship papers — court appointment and termination must be submitted;

c) Statements of the person, his or her parent(s), guardian(s), or others certifying no financial support,

d) Certified copies of federal and state income tax returns filed by the person and his or her parent(s);

e) Where none of the foregoing can be provided an affidavit of the emancipated person in explanation thereof and stating fully the grounds supporting the claim of emancipation.

3.3 Presumptions, etc.

a) Residency is not acquired by mere physical presence in Massachusetts while the person is enrolled in an institution of higher education. (See Section 2.1)

b) A person having his or her residency elsewhere than in Massachusetts shall not be eligible for classification as a Massachusetts resident for tuition purposes except as herein provided

1) Any person who is registered at the University as a Massachusetts resident shall be eligible for continued classification as a Massachusetts resident for tuition purposes (until attainment of the degree for which he or she is enrolled) during continuous attendance at the institution.

2) The spouse of any person who is classified or is eligible for classification as "Massachusetts resident" is likewise eligible for classification as a "Massachusetts resident." This provision will not apply in the case of a spouse in the United States on a non-immigrant visa.

3) A person who is an immigrant/permanent resident of the United States (or has applied for such status) is eligible to be considered for Massachusetts residency for tuition purposes provided that he/she meets the same requirements for establishing residency in Massachusetts as are required of a United States citizen. Non-citizens who are in (or who have applied for) refugee/asylum status are likewise eligible to be considered for Massachusetts residency for tuition purposes provided that he/she meets the same requirements for establishing residency in Massachusetts as are required of a United States citizen. All non-citizens must provide appropriate documentation to verify their status with the United States Immigration and Naturalization Service.

4) Those students whose higher educational pursuits are funded by the Department of Welfare, the Massachusetts Rehabilitation Department, or any of the other Commonwealth of Massachusetts public assistance programs.

c) A person does not gain or lose instate status solely by reason of his or her presence in any state or country while a member of the Armed Forces of the United States.

d) For the purposes of this policy the following persons shall be presumed to be Massachusetts residents:

1) A member of the Armed Forces of the United States who is stationed in Massachusetts on active duty pursuant to military orders, his or her spouse and dependent students.

2) Full-time faculty, professional staff, and classified staff employees of the university of Massachusetts system and their spouses and dependent students.

Part IV. Appeals

4.1 Any student or applicant who is unwilling to accept the initial ruling relative to his or her residency classification, or who wishes to seek reclassification, may file a "Residency Reclassification Form."

4.2 Any student or applicant who is unwilling to accept the ruling relative to his or her residency reclassification may submit an appeal through the appeal process established by the campus at which that student or applicant seeks reclassification. The decision on appeal is final and may not be appealed further.

4.3 In any case where the Admissions Office is unable to make an initial determination based on the evidence submitted, the applicant may be required to submit a "Residency Reclassification Form" to the admission office for their review before being finally classified as a resident or a nonresident.

Part V. Penalties

Misrepresentation in or omission from any evidence submitted with respect to any fact, which if correctly or completely stated would be grounds to deny classification as a Massachusetts resident, shall be cause for exclusion or expulsion from or other disciplinary action by the University

The Campus Experience: Services and Support

Academic Enrichment and Academic Support

This chapter describes the wide range of academic and student support services available at UMass Dartmouth.

Help with Academic Plans and Goals
Students are aided in their adjustment to academic life and in their decision making processes through regular conferences with a designated faculty advisor. Each college has an academic advising network for its students, and the campus-wide Academic Advising Center serves students in transition.

The key activities of advising are to help each student formulate academic and career goals, select courses that will meet those goals, and monitor progress toward fulfilling degree requirements. Students also consult their advisors about academic problems and concerns, to arrange special learning opportunities, or for advice about further study or careers. Students meet with their advisors at least every semester, to select and obtain approval of their courses for the upcoming semester.

For more detail and official guidelines, please refer to the "Academic Advising" section in the chapter on Academic Policies and Procedures.

Academic Advising Center
The Academic Advising Center, located on the ground floor of the administration building, is open Monday through Friday throughout the year. Students may consult the faculty advisors of the Center on a walk-in basis, or by appointment when classes are not in session. The Center assists students with special issues or concerns, and provides guidance to those considering changing a major or who need assistance with the university's advising system. It also is the site of academic advising for Liberal Arts students, who have not yet selected a specific major, for first and second year business students, and for other students as well. The Center is staffed by faculty members drawn from every college in the University and has a Director, Dr. John Carroll, Professor of Political Science, appointed from the faculty.

International Study and Travel
Students interested in pursuing a course of study and travel in another country may obtain assistance in academic planning from The Academic Advising Center. Information about foreign and domestic colleges and universities offering these programs is available from the Academic Advising Center, Foster Administration Building, room 008. Students may remain registered as continuing students of this university while they pursue studies abroad, through Withdrawn on Exchange status.

University Honors Program
University-wide honors activities are available to students who demonstrate high academic achievement. This program is described more fully in the Interdisciplinary and Special Programs section of this catalogue.

Pre-Medical and Pre-Law Advising
Students who wish to prepare for admission into graduate schools of medicine or law have many options open to them. By the judicious use of electives, any student within the College of Arts and Sciences can satisfy the course requirements of most medical or law schools. Any student interested in pursuing one of these careers should see one of the following advisors early in his or her academic career:

•
Medicine: Prof. Alan Bates, or Prof. Catherine Neto, Chemistry Department; Prof. Debra J. Ellis, Prof. Robert Griffith, or Kenneth Oliveira, Biology Department; Prof. Eileen Carreiro-Lewandowski, Medical Laboratory Science Department; Prof. Jay Wang, Physics Department; Dr. Barry Haimson, Psychology Department. The Biology and Chemistry Depart-ments both offer formally-structured pre-medical options, or advisement tracks, but pre-med advising is available to students, in any major, who are aiming at a medical career.
•
Law: Prof. Kenneth Manning, Political Science Department

University Enrollment Center
All students (Day, Evening, Summer and Graduate) receive comprehensive enrollment and financial services at the University Enrollment Center.

All in one location, students can
- pay tuition, fees, and housing charges
- check the status of financial aid (and get help understanding it)
- register for classes; add and drop classes; etc.
- check their billing account (and get help understanding it)
- get a copy of class schedule
- check transcript or obtain or order transcripts
- obtain or submit financial aid forms or documents
- obtain enrollment certifications for health insurance or other purposes
- and most importantly, obtain advice and assistance!

By integrating financial and registration services in one location, the university
- assists students with the interrelationships between their aid, registration, and account status
- eliminates the necessity to go to three or four different offices
- refers special problems to the best place for immediate, quality assistance.

The University Enrollment Center counter is located in the Foster Administration Building Lobby

Academic Resource Center
The Academic Resource Center (ARC) is an academic support service which provides peer tutoring and small group review sessions for UMass Dartmouth students. These support activities are provided free for courses through the three area centers of the ARC.

•
Math and Business Center, Sokratis Koumas, Director, Group I-010, x8716
Tutoring in algebra, calculus, accounting, economics, management science, elementary statistics, and other quantitative courses.
•
Science and Engineering Center, John Fernandes, Director, Group II, 217B, x8718
Tutoring in biology, chemistry, physics, computer science, nursing, civil, electrical, computer, and mechanical engineering.
•
Writing/Reading Center, Amy Parelman, Director and Noreen Cleffi, Assistant Director, Group I-220, x8710
Tutoring in English, history, philosophy, political science, psychology, sociology, English as a second language, essay writing, research papers, business and technical communication, reading, and study skills.
•
Disabled Student Services, Carole Johnson, Director, Group I-016, x8711
Support for learning and physically disabled students, including mobility assistance, note takers, information for Talking Books, advocacy.
•
ARC Central Office, Thomas Daigle, Director, Group I-005, x8709
The Academic Resource center is open daily when classes are in session. Call for additional information.

Through a federal grant, the Academic Resource Center (ARC) makes the following student support services available to eligible students: mentors, study groups and study partners, assistance in preparing applications for graduate school, individualized needs assessments, cultural activities, and academic enrichment activities.

The US. Department of Education awarded TRIO funding to the Academic Resource Center (ARC), which administers grant services to eligible students at UMass Dartmouth. For information concerning eligibility and/or services available contact Thomas Daigle, Director, at the ARC Central Office, Group I-005, x8709.

University Library

The University Library provides information in support of all academic programs, research, and intellectual pursuits of the university community. Working closely with faculty, the library staff have developed a strong collection of books, journals, reference works, and databases to meet the ever increasing needs of undergraduates, faculty, graduate students, and the general public.

The largest building on campus, the library has seating for 1,200 people, and is open seven days a week during the academic year. In addition to a book collection of more than 285,000 volumes, the library subscribes to more than 2,000 periodicals and has more than 15,000 non-print items. More than 16,000 titles are available electronically. All of these materials are accessible through an online catalog available in the library and accessible from anywhere via the campus network and the Internet. To help students use these and other resources, the library provides one-on-one and group instruction.

E-reserves, a digital reserve system, enables students to access and use reserve items from any location on or off campus at any time.

The university identification card (UMass Pass) with library barcode entitles students and faculty to use and borrow library materials from any public college or university in the state as well as a number of local libraries. In addition, a large interlibrary loan network and delivery system makes millions of volumes available to library users.

UMass Dartmouth is also part of the Boston Library Consortium, an association of major college and research libraries in New England, and is a key participant in its Virtual Catalog Project. The Virtual Catalog allows the individual patron to directly search and order books for borrowing from libraries throughout the state.

The University Library maintains an interesting browsing collection of recent books on the first floor to encourage casual reading. Recorded books and videos are also shelved nearby on the first floor.

For more information about the library, visit its web site at http://www.lib.umassd.edu

Computing on Campus

Computing and information technology are integral to the curriculum at this university. Faculty members have developed creative and effective ways for students to learn by using computers utilizing smart classrooms and the Web.

At UMass Dartmouth, the many computing and information technology functions and services are administered through Computing and Information Technology Services (CITS). A team approach provides unified services in the areas of computing support, cluster/classroom operations and support, information systems, instructional development and support, web site development, microcomputer maintenance and repair, networking and systems, and operations and access. For questions or information, please call the CITS Customer Support Center 508 999-8790 or e-mail cscenter@umassd.edu

The backbone of institutional computing at UMass Dartmouth is the UMDNet that allows access to a number of campus computing activities. These include access to the Internet, e-mail, student information, the library system, the campus web site, CyberEd/UMass Online, and distance learning. These network services are accessible from every part of the campus including student housing (ResNet) via direct Ethernet communications. Every student receives an e-mail account which can be accessed using POP or IMAP clients and by using http://webmail.umassd.edu/

The ALPHA cluster, running an OpenVMS operating system, has the following programming languages available: Basic, Fortran, Pascal, C++ and COBOL. Students also have access to student information such as courses, registration, grades, transcripts, and billing information via Web Student.

UMDNet is a part of the Internet global network making possible communication with and access to off-campus locations.

Along with UMass Dartmouth's Web page, CITS uses a listserv approach through UMDAnnounce, UMDNotify, and UMDAlert to provide campus announcements, important information, and emergency information, respectively. At the beginning of each semester all new students are subscribed; those wishing to unsubscribe from UMDAnnounce may do so.

Students living on campus have the opportunity to connect to the UMass Dartmouth Residential Network. This provides a significantly faster Internet connection than those available through a traditional telephone line. Every bed in the residence hall has a port, which means that every student can have a network connection in the room. Students may obtain self-install packets from the Residential Network Operations Center (ResNOC) located on the ground floor of Phase 3A in traditional housing. Telephone and e-mail support are available at extension 8040 (ResNet Help Line) and at resnet@umassd.edu.

Students who wish to access the Internet from off-campus must establish with an Internet Service Provider (ISP) and have the necessary equipment required by the provider in order to access the service. A number of providers will connect your off campus computer to the Internet and UMass Dartmouth.

CITS provides access, user support, and training for students, faculty, and staff for the following:

- Help Desk. CITS provides walk-in help desk services through a student Help Desk located in the Library basement (phone 508 999-8884; e-mail citshelp@umassd.edu), or a student Residential Help Desk (phone 508 999-8040; e-mail resnet@umassd.edu) located in the residence halls, and a Faculty and Staff Help Desk (phone 508 999-8790; e-mail cscenter@umassd.edu) located in the Computing Support Center.
- Documentation. CITS provides free printed documentation in the public access computing facilities and distributes the Student Guide to Computing and Getting Wired widely.
- Training. CITS offers New User Sessions teaching basic, intermediate and advance

skills for supported hardware and supported software applications. For information on the sessions, call our Help Desk at 508 999-8884 or send e-mail to citshelp@umassd.edu

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CITS offers nearly 350 Macintosh and Windows microcomputers in public access computing labs and classrooms located in the Library, residential housing, and most academic buildings. CITS also has a number of campus partners to include the Colleges of Business and Engineering, the Computer and Information Sciences and English Departments, and the Library. Partnering offers prioritized access to the campus partner in specialized labs during designated class hours and public access to all students in all majors usually in the evenings and on weekends.

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Employment. CITS provides many student employment opportunities; hiring more than 100 students as Computing Assistants, Residential Assistants, and Graduate Assistants within the various teams.

Active distributed learning is evidenced by our campus' unique and nationally recognized CyberEd offerings, UMass-wide distance learning courses, and the Impulse programs. CITS currently supports three distance learning classrooms on the main campus and one at the School for Marine Science and Technology (SMAST) located about six miles southeast of the main campus. While the facilities are in various stages of development, there are a number of distance learning courses that are offered/received via our UMass sister campuses (Amherst, Boston, Lowell, Worcester) as well as Martha's Vineyard and Attleboro via the UMass Dartmouth Division of Continuing Education. This includes distance-learning courses taught by faculty from each of UMass Dartmouth's five colleges. Additionally, as faculty development and support programs are implemented, CITS expects to facilitate even more courses through this medium.

Through the CyberEd program, UMass Dartmouth has offered web-based courses to students from around the world since its pioneering efforts which began in 1995. Online classes in art history, music, writing, physics, history, chemistry, nursing, web design and others have been offered at the graduate, undergraduate or non-credit level. With the initiation of UMass Online this system is expected to grow dramatically with the introduction of certificate and degree programs in the coming year. Some of the new programs and courses are "hybrids" - that is, some courses may be taken partially online, and partially in the traditional face-to-face classroom giving the best of both worlds. The new courses and programs are supported in part through the system wide effort known as UMass Online. As this better defined it is expected to offer students many more opportunities not only in terms of when and where they take a course, but in the variety of courses and programs available.

CourseBuilder, an in-house developed tool, assists faculty in incorporating the Web into course delivery. CourseBuilder provides for syllabi, assignments, links to outside resources, papers, lecture notes, and course discussion items, all posted through web browsers with no special skills required of faculty or student. The technology has been adopted for all English 101 classes, and more than one third of the total faculty have used it. As course offerings have expanded, CyberEd faculty, students and staff have the opportunity to experiment with a variety of teaching techniques and on-line technologies. This activity is expected to expand with the introduction of new, still more effective tools. Accompanying this will be a new training facility for faculty, staff, and K-12 teachers in the region, as well as a new instructional support center where faculty will find a variety of tools and expertise available to help them incorporate Web use in instruction.

Faculty and staff receive Web accounts through https://ssl.umassd.edu/webaccount/ that are used to grant them access to *CourseBuilder*, personal and departmental Web sites, the work order systems, and other web-based activities.

For additional information visit http://www.umassd.edu/cits/

College Now

College Now is an admissions and support program for students whose educational achievement has been hampered as a result of social, educational, or economic inequities. From the moment of admission to graduation, students enrolled through the College Now Program are provided with essential supportive services. College Now freshman students participate in an individualized Fall academic program in which they receive assistance and guidance in developing and sharpening those basic academic skills and attributes that are vital to their success at the university. Each College Now student is assigned a counselor who, during the student's five years to graduation, will offer assistance with goal setting, academic achievement, and short- and long-range planning.

See the Admissions section of this *Catalogue* for information about admission to the university through the College Now program.

Office of University Registrar

Located on the first floor of the Foster Administration building, this office serves the instructional program by preparing, retaining, and making accessible all records pertaining to the academic programs and the academic work of the individual students of the university. Here students register for classes and receive the records of their progress and achievement; when they graduate, all students' academic records are made available through a transcript-production service. Here the schedules of the instructional program are prepared each semester for the academic departments.

Beyond such services, the Office maintains the record of the university's academic affairs through the computerized Student Information System and monitors and enforces many of the academic procedures and policies of the university, as described in the Academic Policies and Procedures section of this *Catalogue*.

Services for Veterans

VA programs are approved for benefits available under specified chapters of Title 38, U.S. Code. Eligible students must obtain an application on campus, or from their regional Veterans Administration Office. UMass Dartmouth will issue a Certificate of Eligibility which should be presented to the Office of Veterans' Affairs for certification of enrollment. It is the veteran students' responsibility to notify the university of any changes in course credit load or addresses, in a timely manner.

Veterans' tuition waivers are available for those individuals who are considered Veterans under M.G.L. Chapter 4, Section 7 (43), including WWI, WWII, Korean, Vietnam, Lebanese peace keeping force, Grenada rescue mission, the Panamanian intervention force, or the Persian Gulf, provided they meet other eligibility criteria, to include: a permanent legal resident of Massachusetts for at least one year and in

accord with the university's residency requirements; not in default of any federal student loans or owing a refund; must be a degree candidate or eligible to apply for a degree candidacy.

Disabled Student Services
Disabled Student Services, a part of the Academic Resource Center, provides support to both learning and physically disabled students by helping them pursue their educational goals while adjusting to their new environment. The following services are provided on an individual basis:

- mobility assistance
- reading assistance
- note-taking
- alternative testing
- peer and professional counseling
- advocacy and support
- organizational skills

By assisting with university procedures such as orientation, residence hall placement, and student registration, DSS maximizes its ability to help by interacting with other departments. The DSS also organizes and holds workshops addressing sensitivity and awareness within the university.

UMass Dartmouth policy regarding admission and access to programs prohibits discrimination on the basis of disability. While new applicants and enrolled students are not required to disclose a disability, it is highly recommended they contact the Office of Disabled Student Services to confidentially discuss accommodations that may be needed. These conferences are kept entirely separate from the admissions decision, and enable students to determine if UMass Dartmouth can meet their needs. The information will be used in accordance with 34 Code of Federal Regulations Part 104.

The Director of Disabled Student Services is Carole J. Johnson. The Office is located on the Ground Floor of Group I, room 016. Inquiries are invited by phone at 508 999-8711 or by e-mail to cjohnson@umassd.edu

Upward Bound Program
Upward Bound is a college preparatory program that provides academic and counseling support services to students who attend New Bedford, Westport, and Greater New Bedford Vocational High Schools. It is designed to generate the skills and motivation necessary to succeed in post-secondary education. This objective is achieved by providing students with tutorial and instructional services coupled with intensive academic, career, and personal counseling.

During the Academic year students enroll in the Upward Bound course at their high school. The course is designed to instruct students in areas relevant to becoming strategic learners as well as areas of social and cultural interest. Class time is also set aside for tutorial help.

The program also offers a six-week summer residential component on the UMass Dartmouth campus. Students attend classes in a variety of subjects, and many are offered a tuition-free college course. Academic activities are paired with a host of other activities and trips, culminating in a student-developed Production at the end of the program.

All Upward Bound students have been defined as "at risk." The support services they are offered encourage and motivate them to complete high school and go on to institutions of higher learning.

Student Affairs Mission Statement
The Division of Student Affairs is an integral part of the educational process and offers programs and services that assist students in achieving their fullest potential at UMass Dartmouth. As administrators, educators, advisors and advocates, we strive to provide an environment that holistically promotes personal growth, leadership development, social responsibility, student empowerment, involvement, and well-being in the intellectual, social, cultural, spiritual, emotional, career, and physical realms.

We are committed to building a community:

- where quality deliverables are accessible and where a receptive and well-trained staff is efficient, caring, responsive, and user-friendly.
- where civility is affirmed; community service is rewarded; access and retention are supported; the living and learning environments are cohesive; student life is vibrant and possesses school spirit and traditions; student rights and responsibilities guide behavior for the common good; and diversity, respect, and tolerance of differences are aggressively pursued on an individual, institutional, and global level.
- where learning and personal development through co-curricular programs foster an environment where students learn outside of the classroom through increasing opportunities and raising student expectations and through involving students in decision-making and leadership roles.

The division's programs and services are designed to motivate and inspire students to devote time and energy to educationally purposeful activities and support an effective academic community.

Vice Chancellor for Student Affairs
The vice chancellor and associate vice chancellor direct and supervise all of the activities of the Division of Student Affairs to meet effectively the broad educational goals of the university and the individual needs of students.

The vice chancellor's office serves as an advocate for all students. As a member of the top administration of UMass Dartmouth, the vice chancellor serves as a liaison between the faculty and the co-curricular needs of the student.

Associate Dean of Students
The Associate Dean of Students assists students in personal and social matters and strives to improve the quality of campus life by helping students and organizations. In addition, the Associate Dean of Students supervises the staffs of the Student Activities Office, International Students Office, Coordinator for Student Judicial Affairs Office, and Greek Affairs Office. The Associate Dean of Students also coordinates New Student Orientation programs and services as advisor to the freshman class. The Associate Dean of Students reports directly to the Vice Chancellor for Student Affairs.

International Students' Advising
The Academic Affairs/Graduate Studies office issues initial student visas to graduate students, and provides visa-related services to students, faculty, and staff. This office also oversees the university's many exchange-student programs.

The Coordinator for International Students, Christina Bruen, and the staff of the **Office for International Students** serve international students by providing general advice and assistance with campus life and personal needs. Ongoing support with visas and other immigration forms is available as well as assistance with documentation that students need while studying at the university. Workshops are offered during the course of the year pertaining to employment, taxes, and other subjects of particular interest to international students. Cultural events are cosponsored by the this office and other organizations on campus.

Judicial Affairs
The Judicial Affairs Office is responsible for overseeing the development, distribution, and enforcement of university student conduct regulations and publishing the Student Handbook. The mission of the Judicial Affairs Office is to foster the development of community standards and individual behavior through education, with an emphasis on policies and procedures, and student rights and responsibilities. The Office of Judicial Affairs is located in Room 209, Foster Administration Building. For more information, phone 508-999-9205.

Counseling and Student Development
The Counseling and Student Development Center offers a safe, supportive place for students to explore concerns, clarify choices, and develop action plans. Services are free and confidential. Students can make an appointment by calling 508 999-8648, or students can walk in and be seen immediately between 12:30 and 2:00 pm each working day The Center is located in the Auditorium Annex and open from 8 am to 5 pm, Monday through Friday.

The Center provides individual counseling for personal issues such as relationship problems, homesickness, adjustment to college life, bereavement, depression, poor self-esteem, anger management, procrastination, anxiety, eating disorders, ADD, learning disabilities, academic problems, and test anxiety. A consulting psychiatrist is available to see students who might benefit from a trial of medication. In addition, each semester several personal growth or support groups are offered. Career interest testing and help in choosing a major are also available.

Workshops are offered each semester on topics such as leadership skills, assertiveness, time management, improving your memory, preparing for graduate school, and other topics important to success in college. Students may use the Center's self-help library of books, handouts, videos, and pamphlets as well as an educational resource library with information on graduate and undergraduate institutions and testing programs for entry into graduate and professional programs. The Center also offers a support group for graduate students working on a dissertation or thesis.

Alcohol and Drug Education
The Alcohol and Drug Education program
- supports students and staff in demonstrating responsible conduct regarding alcohol and drugs;
- promotes attitudes and behaviors regarding alcohol and drugs which create a university atmosphere of civility and discourage any behavior that is abusive to oneself or others; and
- provides, consultation, evaluation, intervention, support groups, and referral services to students.

The education program provides orientation for new students about alcohol and drug-related issues and university policies, workshops for student organizations and departments regarding assessment of alcohol/drug troubled students, weekly professional lectures and seminars on current alcohol and drug related topics, an extensive alcohol and drug education library, alcohol and drug awareness weeks, and assistance to faculty in teaching about alcohol and drug-related issues.

The program offers a mandatory multilevel program for students who violate the university alcohol and drug policy. Intervention is available to any student identified as having a problem with alcohol or drugs. Any student, staff, or faculty person can request intervention support information from the Alcohol/Drug Education Coordinator.

A student organization, **Peer Alcohol Concerns Educators (PACE)** is a peer resource for student alcohol and drug concerns. Experiential learning credit is available. For information, contact Laurajane Fitzsimons, Alcohol and Drug Education Coordinator, Counseling and Student Development Center, Upper level, Auditorium Annex, 508 999-9153 or Lfitzsimons @umassd.edu

Career Resource Center (CRC)
The CRC provides a wide array of career resources and services to help students clarify career goals and develop professional skills. Individual career advisement sessions are available by appointment. Workshops are offered frequently in a variety of career-related areas such as résumé writing, interviewing techniques, career planning and professional etiquette.

The Center also coordinates all on and off campus student employment, including Federal Work Study.

The CRC's Career Resource Library helps students research and explore careers and find employment opportunities. Various job listings are available including full-time, part-time, and summer employment. Internship, experiential learning and co-op opportunities are also available both in the library and, on our website www.umassd.edu/CRC. Students may visit the library on a drop-in basis.

The CRC also coordinates special career-related events and activities such as the annual Career Expo which has become one of the largest on-campus job fairs in southeastern New England. Other activities include Career Chats, Student Employee Appreciation Day and Take Our Daughters to Work Day, which is co-sponsored by the Women's Resource Center. The CRC coordinates on-campus recruitment for seniors.

The CRC helps students identify and arrange

experiential learning and internship opportunities, which offer work experience for academic credit. On-campus or local placements are widely available. Students may also seek such placements as Disney World in Orlando, Florida, and The Washington Center in Washington, DC. These many opportunities are described fully in the chapter of this catalogue on Special Learning Opportunities.

The CRC is committed to helping UMass Dartmouth foster a service ethic on campus. To this end, assisted by Dierdre Healy, Community Service Coordinator, the CRC coordinates community service activities through the Community Service Desk and by publishing a Community Service Guide to assist students in finding meaningful and rewarding service activities. There are community service-related work study opportunities such as the Community Service Learning Program and America Reads Program and a host of volunteer agencies and activities in local communities. All students are encouraged to participate in special community service events such as Make A Difference Day and Hunger and Homelessness Clean-Up Day.

ROTC (US Army Reserve Officers Training Corps)
UMass Dartmouth undergraduate students may participate in Army ROTC through a cooperative program with Providence College in Rhode Island. The US Army Reserve Officers Training Corps (ROTC) teaches leadership, team work, and responsibility through a curriculum that includes elective courses, leadership labs, and physical fitness training sessions. The Patriot Battalion is located at Providence College which also serves UMass Dartmouth, Bristol Community College, Brown University, Bryant College, the Community College of Rhode Island, Johnson and Wales University, and Rhode Island College. The ROTC Program is designed to prepare men and women for success in college, as an Army Officer or for any chosen career, and offers opportunities for financial assistance in the form of scholarships.

The ROTC program, conducted by agreement with Providence College, has the following features:

- UMass Dartmouth students may participate in Providence College's ROTC program and receive benefits from so doing, including financial aid.
- Students register for Providence College courses at Providence College. We do not provide registration services for these courses on the UMass Dartmouth campus.
- Students can get ROTC courses/credits posted to the UMass Dartmouth transcript using the methodology for Transfer Credit, according to the transfer credit policies of their specific academic department. Students planning to participate in ROTC should definitely use the Transfer Course Prior Approval process, to receive initial departmental approval of such transfer credit.
- Students obtain ROTC program advising and access to scholarships through the ROTC program at Providence College.

The Office of Career Services at UMass Dartmouth will serve as a contact point for students. At this location, students interested in ROTC may:

- Obtain information and materials about ROTC in general and the program at Providence College.
- Obtain assistance in contacting a Providence College representative of the ROTC program.
- Learn about courses offered each semester at Providence College and obtain assistance with the process of Providence College registration.

For additional information call the Career Resource Center at 8655.

Health Services
The Health Services Office is located in Elmwood Hall, phone 508 999-8982. During the academic year, a physician and nurse practitioner(s) are on duty each class day. Two registered nurses, a consulting dermatologist, and a consulting nutritionist are also on staff. This office is equipped to handle most health related problems students may encounter while at UMass Dartmouth. Referrals are made to community resources when appropriate.

All services are available to all students through the Student Health Fee. The Health Office is concerned with the total well-being of each student and is committed to health education and disease prevention. Also, Health Services contracts for student health insurance. The Commonwealth of Massachusetts requires university students to have comprehensive health insurance, and information regarding coverage is included with each student's tuition statement. See the chapter on Expenses for the policies on the university's health insurance requirements.

Frederick Douglass Unity House
The Frederick Douglass Unity House is the first cultural center established on the UMass Dartmouth campus, opening in September of 1995. The mission of the Unity House is to institutionalize on the UMass Dartmouth campus an environment which nourishes the special academic, cultural, informational and social/communal needs of students, faculty and staff of color. All students, faculty, and staff are welcomed and encouraged to share in the development of this vital organization.

The facility provides a culturally focused library, study area, computer facilities, meeting/conference room, and lounge. Students play a major role in the operation of the center by creating programs and events that help to achieve the mission of the center. All members of the university community, especially students, are encouraged to develop activities that will assist the Unity House to fulfill its goals and mission as well as celebrate diversity at UMass Dartmouth. The Unity House is located in Resident Dining Building, phone 508 999-9220.

Religious Resource Center
Campus Ministry coordinates the religious activities and serves the spiritual needs of the university community. Clergy and ministers from major religious denominations provide opportunities for worship, spiritual direction and counseling, and special programs. The office is located on the second floor of the Campus Center—phone 508 999-8872. The university hosts a Catholic Student Organization (8872), UMass Dartmouth Christian Fellowship (8584), Episcopal/Protestant Ministry (8875), and Jewish Student Center/Hillel (9241).

Multicultural Support Services and Assessment
This office provides support services to the students of color at UMass Dartmouth, both undergraduates and graduate students. The program's primary goal is to increase the retention and success of students of color at the university, and another important goal is to help the university community better to meet, understand, and appreciate the needs of students of color. Phone 508 999-8602 to contact the Director, Norman Barber.

A List of Clubs and Organizations

The following list is presented to show the range and variety of student clubs and organizations. Refer to the Student Handbook for official details and contact persons.

Academic and Honor Societies
Accounting Association
American Association of Textile Chemists and Colorists Club
American Marketing Association
American Society of Civil Engineers
American Society of Mechanical Engineers
Association for Computing Machinery
Biology Association
Center for Rehabilitation Engineering
Ceramics Club
Chemistry Club
Delta Mu Delta
Disabled Students Coalition
Economics Association
Engineers Student Chapter
Eta Kappa Nu, Zeta Xi Chapter
Fibers Club
Finance and Investment Club
French Club
Golden Key International Honor Society
History Association
IEEE Computer Society
Institute of Electrical and Electronic Engineers
Literary Association
Medical Laboratory Science Club
Metals Guild
National Society of Professional
NSPE Massachusetts Society of Professional Engineers
Phi Psi
Philosophy Club
Physics Club
Pi Sigma Alpha, Mu Kappa Chapter
Political Science Association
Pre-MBA, Pre-Law, Pre-Med Associations
Psi Chi
Psychology Association
Sculpture Club
Senior Nurse Pinning
Sigma Delta Pi, Mu Phi Chapter
Society of Automotive Engineers
Society of Manufacturing Engineers
Society of Women Engineers
Student Chapter of the Association for Computing Machinery
Tau Alpha Pi, Delta Delta Chapter
Theta Kappa Chapter of Sigma Theta Tau
UMass Dartmouth Student Chapter: Clinical Laboratory Science
UMass Dartmouth Student Nurse Association
Wood Club

Campus Events
Council on Cultural Diversity and Pluralism
Cultural Affairs Committee
Gallery
Lecture Series Committee

Ethnic Heritage and Multiculturalism
Asian Student Association
Cape Verdean Student Association
Chinese Student Association
The Diversity Circle
Frederick Douglass Unity House
Indian Students Association
Luso-American Student Association
Portuguese Language Club
Taiwan, Republic of China Student Association
The Office of Multicultural Support and Assessment
United Brothers and Sisters
United Latino Society

Global Organizations
Amnesty International
MassPIRG

Greek Life
Alpha Sigma Tau
Beta Theta Pi
Iota Phi Theta
Phi Sigma Sigma National Sorority
Sigma Tau Gamma Fraternity

Music
Concert Band
Jazz Improvisation Ensemble
Music Guild
Pep Band
Stage Band
UMD Chorus
UMD Gospel Choir
UMD Spinners

Religious
Catholic Campus Ministry
Catholic Student Organization
Christian Fellowship
Episcopal and Protestant Ministry
Hillel-Jewish Student Association
Islamic Society of UMass
Religious Resource Center
Wiccan Pagan Coalition

Special Interests
Book Art Center
Campus Design
Circle K Club
Dance Club
Division of Student Affairs' Spirit Group
Experiential Programs, Internships
Feminist Majority
Fine Arts Committee
International Student Leadership Institute
Literary Club
Massachusetts Community Water Watch
Pride Alliance (BiGaLA)
Southeastern Massachusetts Partnership
Student Athlete Advisory Board
The University Food and Dining Committee
Theatre Company
Twenty Cent Fiction
UMass Aviation Club
WSMU Radio - 91.1 FM

Student Government
Board of Governors, BOG
Class Officers
College Democrats
College Republicans
Division of Continuing Education Student Government
Residence Halls Congress
Student Senate

Student Publications
Deadline Studios
Scrimshaw (yearbook)
Siren
Temper
The Torch (student newspaper)

Children's Center for Learning
The Children's Center for Learning, a licensed, professionally staffed early learning facility, is available for the children of students, faculty, and staff. To be eligible for enrollment, children must be between two years and nine months and six years old. Hours are from 7:30 am. to 5:00 pm. on all days when the university is in session during the academic year. The Center is located in the Residence Halls, Phase IIIA. Additional information is available from the Director at 508-999-8873.

Women's Resource Center
The information and services offered by the Women's Resource Center (WRC) reflect the interests and concerns of women: health, social, and legal issues. The center provides cultural opportunities that further women's personal and professional development and promotes a broader understanding of the diverse experiences of all women. The WRC acts as a central coordinating agency for campus and community groups.

The Center offers programs on women's health, political activism, diversity, violence against women, and sisterhood. Each semester the WRC sponsors discussion groups, forums, and workshops on topics such as sexual harassment, gender equity, racism, women's ways of leading, motherhood, ageism, and sex.

The WRC has a variety of resources including:
- a library containing more than 600 books, references, and recent publications
- videos
- a lounge for group or classroom use
- conference room for meetings

The WRC is a member of the Women's Centers Caucus of the National Women's Studies Association. The Center can provide information on nationally scheduled events which are held throughout the year, such as reproductive rights conferences, women's conferences, and political rallies. Information is also available on lectures and events in nearby communities. The center collaborates closely with the university's Women's Studies Program.

The Women's Resource Center is open year round and is located in Pine Dale Hall. The director is Juli L. Parker, phone 508 910-4584.

Student Activities, Clubs, and Organizations

Campus Center
The Campus Center is the heart of the co-curricular activities and services of the University. It is the community "living and dining room" for all members of the University family: students, faculty, staff, alumni, and guests. Housed in the Campus Center are such services as the Campus Shop, Main Cafeteria, Sunset Dining Room and Pub, Underground Cafe, UMass Pass (debit card), Snack Bar, and Information Center. Also housed in the Campus Center are 21 clubs and organizations, the Student Activities Office, the Radio Station, and the university newspaper. The Campus Center is open daily. The Main Auditorium is home to the University Theater Company and used by many organizations for large concert hall type events. Community events are often held in the Auditorium, which is a fully equipped theater. The Community Art Gallery is in the Auditorium Lobby.

Office of Student Activities
The Office of Student Activities is the center of student activities and co-curricular programs. It provides assistance and resources in all aspects of program planning, to student organizations and clubs. The Coordinator of Student Activities coordinates the activities of about 100 student organizations and advises the Student Activities Board, which sponsors university-wide programs. The office also has a publicity staff that provides advertising services for any campus group or function.

The Student Activities Board plays an integral part in the educational development of UMass Dartmouth students by involving them in the planning of events. SAB is the largest volunteer student campus organization. The Office of Student Activities advises all organizations on the implementation of their programs—from answering questions to assisting with the entire event.

MassPIRG
The Massachusetts Public Interest Research Group is a state-wide, nonprofit and nonpartisan organization directed solely by students. MassPIRG has two basic goals: to research and promote solutions to important social problems at the local, state, and national levels; and to teach students civic values through a variety of project and internship opportunities. As approved by the university's student government, the valuable public-interest work of this organization is supported by a waiveable fee.

Greek Affairs
The Associate Dean of Students works closely with the Greek Liaison/Advisor to develop programs and policies. This office also provides service to Greek groups such as training, and assists groups with meeting the requirements of their national offices.

Student Government
Students hold office in various organizations that govern the campus, and they serve on committees that determine policies and directions for many aspects of campus life.

The Student Senate is the major governing body and offers a forum for debate on matters of importance to the student body. The Senate also appoints students to membership on a wide range of university committees. Students are active, voting participants on many of the committees that recommend policies and regulate procedures for academic as well as social aspects of the university. A student is also elected to the Board of Trustees of the University of Massachusetts.

Golden Key International Honor Society
UMass Dartmouth has been accepted to charter membership in the Golden Key International Honor Society. Our students ranked among the top 15% of juniors and seniors are invited to become members. Activities include participation in regional and national leadership conferences. Lifetime membership is a tribute to academic achievement and also an investment that can provide leadership training, scholarship opportunities, and career assistance.

Student Athletics

Intercollegiate Athletics
The university is a member of National Collegiate Athletic Association (NCAA), Division III, the Eastern Collegiate Athletic Conference (ECAC), the Little East Conference (LEC), the New England Football Conference (NEFC), and the New England Women's Lacrosse Alliance (NEWLA). The university fields intercollegiate teams for men in baseball, basketball, cross country, football, golf, ice hockey, lacrosse, soccer, swimming and diving, tennis, and track and field (indoor and outdoor). Intercollegiate teams for women are fielded in basketball, cheerleading, cross country, equestrian, golf, field hockey, soccer, softball, swimming and diving, tennis, track and field (indoor and outdoor), volleyball, and water polo.

The Director of Athletics is Robert Mullen. One may contact the department at 508 999-8720.

Intramural and Instructional Athletics
Intramural opportunity for all students is provided in basketball, cross country, flag football, co-ed soccer, swimming, tennis, volleyball, water basketball, water polo, softball, and co-ed softball. Non-credit courses are offered at convenient times for all interested students in the following: aerobics, step aerobics, weight training, fencing, swimming, endurance swimming, water aerobics, first aid, lifesaving, WSI, scuba, CPR, kayaking, and Tae Kwan Do.

Facilities
Facilities are available for recreational use by students throughout the school year. They include the fitness center, gymnasium, swimming pools, running track, various athletic fields, and tennis courts. Equipment is also available. Schedules are available in the Tripp Athletic Center or by calling 508 910-6910.

Housing and Residential Life

The Office of Housing and Residential Life, located in Residence Hall IIIA, is responsible for all phases of resident living on campus. This includes social, cultural, and educational programming, custodial and maintenance, discipline, room assignments, and, in general, the promoting of a living/learning environment in on-campus housing. The staff of this office also administers the housing needs of summer students and conferences.

The residence halls are more than just places to eat and sleep; they provide the opportunity for students to become part of a community.

Residence Halls and Student Apartments
The university has six residence halls housing 2,300 students and two townhouse clusters housing 800 students.

The residence halls have 10 and 12 person wings with double and single rooms and one or two bathrooms. Each section of these wings has at least one lounge/kitchenette. Recreation, mail, laundry facilities, and a resident director's apartment are part of each building.

Within the Residence Halls are located a Coffee House, two Computer Clusters, and multi-purpose lounge areas. The Women's Resources Center, Office of International Student Affairs, Honors Program Office, and the Impulse Office are located in the Residence Halls.

Apartment-style living is found in the Cedar Dell student apartments, which consist of 136 five and six person townhouse style apartments housing students in single rooms. Recreation, mail and laundry facilities are available in two student centers. The Cedar Dell Village environment is more autonomous than in the residence halls, and priority for this housing is given to upper-class and graduate students.

A Cable TV signal is provided to each room in both residence areas. Also, each bedroom has a live telephone port and a port to access the computer network.

Smoking
Most areas are nonsmoking. Smokers may ask for a "smoking allowed" room.

Student Involvement
Students participate through the Residence Halls Congress, a collective advisory group representing student interests in the residential facilities. The Residence Halls Congress also creates program opportunities for the on-campus population and in many ways works closely with the Office of Housing and Residential Life to enhance on-campus life.

Charges
Charges for student housing are shown in the chapter on Expenses and Student Financial Services. The Student Handbook gives additional information.

Access to On-Campus Housing
Preference for on-campus housing is given to full-time undergraduate students. Although graduate and non-degree students may apply, priority is given to undergraduates. Special considerations for housing must be approved by the Office of Housing and Residential Life and will be considered on a space-available basis.

Meals for On-Campus Students
Students living in the residence halls receive meals in the Residence Dining Hall. A student may contract for one of several board plans which range from 5 to 19 meals per week, including brunch and dinner on weekends, or may pay a single meal rate which includes unlimited seconds. Charges for student meal plans are shown in the chapter on Expenses and Student Financial Services. (Dining Services are not offered through the Student Services Division but are administered by the Auxiliary Services unit of the university.)

Dining Services for the Campus

The university offers a range of food and dining services.

A la carte dining services are available in the Commuter Café, North Alcove and the Magic Oven Cookie and Coffee Shop. In addition, the Sunset/Cove Room located on the second floor of the Campus Center serves fresh pizza, sandwiches and fresh green salads. Automatic vending machines are located in all buildings.

Arrangements for special functions, and meeting space may be made with the Conference and Function Office located on the ground floor of the Residence Dining Hall. In addition, the UMass Pass Office located in the Campus Store handles Board plans and the UMass Pass Debit Card.

Department of Public Safety

Emergency on campus, dial 9191

The Department of Public Safety provides twenty-four hour a day protection of the entire campus and individuals on the campus. Our police officers are vested with full law enforcement powers, identical to the local police in the community. The Officers are trained at the Massachusetts Criminal Justice Training Academy and also receive annual in-service and specialized training in such aspects as first-aid, CPR, defense tactics, legal updates, evidence gathering, traffic control, and investigations.

The University provides the "DART," a shuttle van for on-campus safety transportation. The service begins at 5:30 each night and ends at 2:00 am, 7 days a week. When there are special events on campus, extended service is provided for one half-hour after the event closes. There is a pre-set route that takes approximately 20 minutes to complete. DART service stops are designated with a sign and are located at the residence halls, the campus center, the gym, Cedar Dell, and the library. The DART does not respond to special requests for transportation except to provide direct service for disabled students.

Any student, faculty, staff or visitor may report a potential criminal action and emergency on campus by calling 9191 for emergencies or 8107 for the police dispatcher.

Crime Statistics
A list of campus crime statistics for the previous three-year period is available from the Department of Public Safety upon request and through the pamphlet, *A Guide to Campus Safety and Law Enforcement.*

Emergency Call Boxes
An emergency telephone system is provided on campus. These emergency telephones are in strategic locations around campus and are easily identified by their distinctive orange containers as well as by their bright blue light during the nighttime. The emergency phones are connected directly to the police dispatch desk. No dialing is required. They may also be used to summon an escort.

Public Safety Programs
A unit in the Department of Public Safety is the Investigations and Crime Prevention Unit. Officers who specialize in selected crime prevention duties staff this section. Programs available through the Crime Prevention section include a the DART shuttle, Rape Aggression Defense (RAD)

course for women, Operation I.D., Alcohol Awareness, and Anti-drunk Driving Workshops.

Safety or Health Issues
Safety is monitored carefully in classes and laboratories in chemistry, biology, medical technology, physics, and studio arts that may contain or use chemicals, bacteria, viruses, silica, asbestos, x-ray, radiation or animals, which under normal conditions are harmless but may affect persons with high risk conditions. Wayne LeBlanc, at 508 999-8242, is the university's Safety Officer.

Students should report to the Health Office, the Office of Facilities and Physical Plant, the Campus Police, or the appropriate department chairpersons anything on campus that could be hazardous.

Parking on Campus

All members of the university community wishing to use their cars on campus must register with the Department of Public Safety and receive a parking sticker. Residence students may keep a vehicle on campus, upon payment of a fee.

Parking decals are available at Mass Pass located in the campus center. Decals for handicapped parking will be issued at the Department of Public Safety; all wishing permits for handicapped parking must register there.

UMass Dartmouth Campus Store
The University Campus Store, located on the ground floor of the Campus Center, carries required and recommended textbooks, reference books, computer hardware, software, general school supplies, school-name clothing, and a good selection of sundries and gift items. Textbooks go on sale in August for the fall semester and in early January for the spring semester. Special order service is offered for hard-to-find books.

Call 508 999-8180 for complete information on store hours, textbook returns, and book buy-back, or visit umassd.edu/campus store

In addition to cash transactions, the Campus Store accepts *VISA, Master Card, American Express, Discover,* and checks in the amount of the sale, with appropriate identification. Also, the Campus Store is integrated with the "UMass Pass" system which allows students, once funds are deposited, to make purchases and charge their accounts.

UMass Dartmouth Alumni/ae Association
All current students should consider remaining active participants in the life of the university, through the UMass Dartmouth Alumni Association. Described here are those aspects of the Association's many activities that relate especially to current students.

The UMass Dartmouth Alumni Association is the largest volunteer organization on campus. It represents the interests of more than 30,000 former students in all 50 states and around the world. Serving as liaison between the university and its former students, the Alumni Association provides opportunities for people to get involved in shaping the future of their school.

This year, alumni contributors will help the Alumni Association provide money for scholarships, gifts, and grants for students, faculty and campus projects. During the Annual Fund phonations, students call graduates to solicit gift support. Alumni also participate in recruitment of new students by hosting get-together sessions in various communities of the state.

Some of the on-campus activities the Alumni Association sponsors include:
- Homecoming Weekend
- Senior Class Pancake Breakfast
- Alumni Employees Pride Day.

On Homecoming Weekend, hundreds of alumni return to campus for events that include the Corsair Hall of Fame induction banquet, the annual Homecoming football game, and a post game party. Students are invited to attend most activities. Various classes and student organizations have reunions at different times of the year.

Students have the opportunity to talk with alumni about career choices throughout the year. During the year career panels bring alumni from various professions back to campus to tell students about their career paths and to offer students tips on how to enter the job market. The Alumni Career Network reference guide is available to students in the Office of Career Services. The guide gives students an opportunity to contact alumni directly for career advice or to arrange visits to job sites.

A description of the programs and activities of the Alumni Association is given in a subsequent section of this *Catalogue*

UMass Pass / Student ID Card
The campus identification card, called the UMass Pass or University One-Card, is required to access the student residences, library, Fitness Center, and various campus activities or events. The One-Card is active for the entire time a student is registered or employed at UMass Dartmouth. There is a fee for new and replacement cards.

The UMass Pass **debit account** is offered to all cardholders. It can be used to purchase services that would otherwise require cash on campus, and at a growing list of off-campus businesses. All forms of payment are accepted, including deposits with Master Card, Visa, or American Express (call 508 910-6913 or mail checks to UMass Pass Office, 285 Old Westport Road, North Dartmouth, MA 02747).

The UMass Pass office is located in the Campus Store and can be reached at 508 910-6440 or 508 999-8188.

Academic Regulations and Procedures

All rules are subject to change in accordance with existing and hereafter adopted university policies. Official changes will be clearly stated in university policy documents.

Notations may indicate when specific regulations became or will become effective. If there is no notation, regulations are now fully in effect.

New in 2003-2004 Catalogue

- A new Grades Amnesty policy allows UMass Dartmouth students returning after an absence of five or more years, in certain cases, to remove previous grades from their cumulative grade average.
- Requirements are clarified for graduating with a double major that involves two different degrees (e.g., BA and BS).
- The meaning of and procedures for Auditing a course are clarified.

Catalogue Commitments

The catalogue which is in effect when a student first enters the university (as an admitted degree student) is generally the one that will govern that student's course and program requirements. However, circumstances may occur that require modification of this principle.

Changes may occur in the requirements for academic programs or regulations. Whenever possible, such changes will be phased in, with the class affected and year when the changes first apply being stated. If a formerly required course or courses should no longer be offered, substitutions will be considered in individual program planning; the institution will attempt to respond flexibly in such cases. In the rare event of an academic program being phased out, those in the program will be given a reasonable amount of time to complete the requirements. Neither transfers in nor new admissions will occur.

For students who return after a period of withdrawal or dismissal (in other words, who do not maintain continuous registration or who leave without a granted leave of absence), the governing catalogue will become that which is in effect when they are re-admitted. Individual requests to be allowed to revert to the earlier catalogue will be reviewed by the dean of the student's college.

Students may wish to change their majors a year or more after they join the university. Such students may be refused the option of using the version of the major that was listed in a former catalogue, being instead subject to requirements of a newer version. Students who entered under one governing catalogue may prefer the requirements in a subsequent catalogue. They may request permission to have that newer catalogue apply to them; in such cases, however, they shall then adopt *all* requirements from the newer catalogue. Ten years is deemed sufficient time for a part-time student, in continuous registration, to complete a degree. If a student takes more time than this, the university will reserve the right to impose the requirements of a later catalogue. Because each edition of the *General Catalogue* may not be prepared significantly in advance of its distribution and the *Catalogue* is not re-edited every year, changes may go into effect before the next edition is printed. Such changes will be clearly stated in university policy documents.

Issues concerning the catalogue that governs for individual students are resolved at the level of the college dean.

Maintenance of University Records

The Office of the University Registrar maintains the official educational records of all graduate and undergraduate students.

The Registrar's Office also conducts registration, arranges schedules, enforces certain academic regulations, and issues official transcripts from the university. Petitions to receive credit toward one's university degree for courses which have been taken elsewhere must be filed with the Registrar. The Registrar also certifies enrollment to the Social Security Administration, the Veterans Administration, insurance companies, banks, guaranteed student loan agencies, and other agencies including higher education loan agencies.

Confidentiality of Records

The university policy on the confidentiality of records is consistent with the requirements of the Family Education Rights and Privacy Act of 1975 (FERPA).

The policy is designed
- to protect the privacy of educational records,
- to establish the right of students to inspect and review their educational records, and
- to provide guidelines for the correction of inaccurate or misleading data through informal and formal hearings.

Students also have the right to file complaints with the Family Policy Compliance Office, U.S. Department of Education, Washington, DC 20202-4605 concerning alleged failures by the university to comply with the Act.

The university is allowed to disclose certain basic information about students without their assent, and is in fact required to do so by state statutes. Such disclosable information is called "Directory Information."

The university has designated the following categories of student information as directory information. student's name, local and permanent addresses, most-recently attended previous school or college, major field of study, dates of attendance, home town where applicable, membership in university curricular and extra-curricular organizations, weight/height of members of athletic teams, and degrees and awards received. Currently enrolled students may withhold disclosure of the above categories of information by submitting written requests to the University Enrollment Center. Once a non-disclosure request has been filed, it will remain in effect until further notification from the student. The university assumes that absence of a student's request to withhold public information indicates individual approval of disclosure.

UMass Dartmouth publishes a directory listing its current students, issuing a new directory each fall semester. The directory will list names, local and permanent addresses, campus electronic mail addresses, major field of study, and dates of attendance or class year. This directory will be sold at a reasonable cost in the Campus Store. It will thus be available not only to students but to members of the general public, including political groups, public or private agencies, and advertisers. As stated above, students may request non-disclosure at the University Enrollment Center.

FERPA restricts significantly the right of others to view a student's educational records. The following are some categories of individuals who *may* view or receive a student's educational records, by federal law

and by the procedures established for the university.

1
The student him or her self (except materials to which the student has waived the right of access, such as confidential letters of recommendation, and records that are not "educational records").
2
Persons whom the student authorizes by name in a written, signed statement that specifies the purpose of the disclosure and names the records to be released. This rule covers special requests and also all requests to send transcript copies to employers or other educational institutions. Such disclosure may be incorporated within signed agreements to participate in an activity or program—for example, receiving a scholarship.
3
Officials of the campus and university who have a "legitimate educational interest" in the information. At UMass Dartmouth, "officials" includes...

- Persons employed by UMass Dartmouth in an administrative, supervisory, academic or research, or support staff position (including some student workers);
- Officers of the UMass central administration; *or*
- Persons, including students, serving on committees where legitimate "need to know" exists (examples are persons serving on a committee that recommends award of scholarships or persons serving on the board of an honor society).

Such officials have a "legitimate educational interest" or "need to know" if performing a task that ...

- Falls within the context of assigned institutional duties or responsibilities;
- Relates to the functioning of the office, position, or committee involved;
- Relates to the education or the disciplining of the student; *and*
- Is consistent with the purposes for which the information is kept.

4
Parents who have established that the minor student is a dependent on their federal income tax. Otherwise parents have no right of access to their daughter's or son's educational records. The university does not routinely share student information in this case, but can use this clause if special circumstances merit its use.

5
Persons or organizations providing financial aid to students or determining those aid awards, as necessary to determine eligibility, amounts, or conditions of an award or to enforce its terms and conditions.
6
Federal grand jury subpoena (without notice to parent or eligible student) and any other subpoena issued for a law enforcement purpose (with notice to parent or eligible student).
7
Appropriate parties in an emergency if the knowledge or information is necessary to protect the health or safety of the student or others.
8
Officials of another school in which a student seeks or intends to enroll, upon request and with appropriate documentation.
9
Certain officials of the US Department of Education, the Comptroller General, and state educational authorities, in connection with certain state or federally supported education programs.
10
State and local officials or authorities to whom such information is specifically required to be reported;
11
Organizations conducting certain studies for or on behalf of the university.
12
Accrediting organizations to carry out their functions.
13
An alleged victim of any crime of violence, of the final results of any institutional disciplinary proceeding against the alleged perpetrator of that crime with respect to that crime.
14
Post-secondary institutions may disclose the final results of any disciplinary proceeding for a crime of violence or non-forcible sex offense *to anyone* if the institution determines that the student committed a violation of its rules with respect to the crime;
15
Post-secondary institutions may disclose to a parent or legal guardian, information regarding a student's violation of any law or institutional rule or policy governing the use of possession of alcohol or a controlled substance if the student is under the age of 21 and the institution has determined that the student has committed a disciplinary violation.

Persons authorized to view or retain a student's educational records, as above, may in no case transmit, share, or disclose the information to any third party. All third-party requests for information should be addressed to the Office of the University Registrar.

The complete UMass Dartmouth FERPA policy statement gives additional details and categories. It also defines what records are deemed to be "educational records" in this context.

A complete copy of the university's procedures and policies regarding the Family Educational Rights and Privacy Act is available for inspection at the Office of the University Registrar. Notification of these policies is distributed in print each year to our active students through the semester *Course Listings* booklets.

Access to One's Educational Records
Students may inspect and review their education records upon request to the Office of University Records. The student should submit a written request which identifies as precisely as possible the record or records he or she wishes to inspect.

The Office of University Records will make the needed arrangements for access as promptly as possible and notify the student of the time and place where the records may be inspected. Access must be given in 45 days or less from the receipt of the request. When a record contains information about more than one student, the student may inspect and review only the portion of the records which relate to him/her.

Requests for Transcripts
Transcripts may be obtained through the University Enrollment Center or from the Registrar's Office. Both official and unofficial copies are available. As of Fall 2001, degree students pay a one-time transcript fee; transcripts are provided to them, and to all others, at no cost both now and for the future. Requests for transcripts must be made in person, in writing, or by FAX, because the student's signature is required as a release. The Registrar will enforce policies to see that transcript requests are reasonable.

Student ID/UMass Pass Card
Students, faculty, and staff are required to have a UMass Dartmouth identification card to access various university services and functions. A fee is charged for new and

replacement cards. Further information is available in the "UMass Pass" section of the chapter on The Campus Experience.

Student ID Number
The university requests all students (except international students who lack them) to submit their social security numbers for use as their student ID number. However, those who do not wish to have their social security numbers used as their student identifier will be issued a special nine-digit number for this purpose, upon formal request to the Office of the University Registrar. Students can be assured that the university will respect and protect their privacy and their social security numbers.

Change of Student Information
Students should notify the University Enrollment Center or Registrar's Office of any change in their student information. A form is made available to report changes in personal information, such as a change of name or address. The student's University Records file is the official repository of individual information such as personal data, major and minor programs, and academic records. Current and accurate information is important, and for some purposes mandatory (for example, for international students to retain visa status).

To earn a UMass Dartmouth undergraduate degree, a student must meet the following UMass Dartmouth requirements:

1. **Be admitted to degree status as a UMass Dartmouth undergraduate student**

   UMass Dartmouth offers the undergraduate degrees of Bachelor of Arts, Bachelor of Fine Arts, and Bachelor of Science. (See the *Graduate Catalogue* for graduate offerings.) Each degree requires being accepted into and fulfilling the requirements of a major. Students are admitted to degree status through the Office of Admissions or through the official degree admission procedures of the Division of Continuing Education. Non-degree students, sometimes called "special students," are not eligible for a UMass Dartmouth degree.

2. **Meet the residency requirement of UMass Dartmouth**

   At least 45 credits of work must be completed at UMass Dartmouth. However, no more than 60 credits can be credited toward the degree from any combination of postsecondary 2-year institutions, advanced placement, or CLEP credits. Credits that may be applied to the degree include advanced placement, CLEP credits, and transfer credits.

   At least 30 credits of advanced and specialized courses must be completed (UMass Dartmouth courses numbered 300 or higher, excluding courses numbered 900—Contract Learning).

   It is expected that students will earn most of their advanced and specialized course credits at UMass Dartmouth Students may be granted permission by the appropriate chairperson and college dean to earn some of these requirements at another institution, so long as UMass Dartmouth major and minor requirements are met to their satisfaction thereby.

3. **Satisfy the general education requirements of UMass Dartmouth**

   This category refers to a series of requirements that all UMass Dartmouth students must meet, beginning with students entering in fall 1998 They are stated later in this catalogue section. Those entering previously do not need to meet a general education requirement (unless returning in fall 1998 or beyond after a lapse from active student status—see "Catalogue Commitments" section, above).

4. **Satisfy the distribution requirements of the college and the academic major**

   UMass Dartmouth requires students to complete distribution requirements according to the degree sought and the program and College. These distribution requirements vary among colleges and majors and with year of graduation. They are described in the college and department chapters of this catalogue. Distribution requirements ensure breadth of studies beyond limits of the academic major.

5. **Complete a UMass Dartmouth academic major**

   In order to graduate from UMass Dartmouth, a student must successfully meet all requirements for a specified major within a recognized department, or an approved inter-departmental major. Specific requirements for each major are included in each department's section of this catalogue.

A UMass Dartmouth major must consist of at least 30 credits in appropriate courses carrying departmental approval; some majors require additional credits. Most majors require a seminar equivalent or special individual project. Such a project may be incorporated in a specific course or carry separate credit.

While some programs require approval of a major early in a student's college career, all UMass Dartmouth students shall be required to request a major no later than the registration period for the fall semester of the junior year. Formal request shall be made to the appropriate chairperson, or as the case may require (e.g., multidisciplinary studies), the program coordinator.

Students whose overall grade point average is above the dismissal grade point average shall be allowed to request a major. (However, most majors require a minimum GPA of 2.0 or higher.) Students whose overall grade point average is below the dismissal grade point average shall be candidates for dismissal.

By being accepted into and fulfilling the requirements of two majors, a student may graduate with one degree and a dual major, or two degrees.

Students admitted to a major may remain in it until graduation, until they shift to another major, or unless they are dismissed from the major because they did not meet a requirement for progression. Requirements for progression in each major are stated in the appropriate sections of the General Catalogue. Such requirements may include (but are not limited to) the following: maintenance of a minimal GPA in all courses or in all major courses; satisfaction of requirements for progress in completing major courses; the passing of one or more mid-program reviews; the meeting of stated requirements for professional practice. Dismissals from a major are recommended by the department to the college dean.

6. **Have a grade point average of at least 2.000 in all courses taken in the major**

   All work required in the student's major field of concentration must be satisfactorily completed. The cumulative grade point average for courses taken in the major shall be set by the department at not less than 2.000.

7. **Have at least 30 course credits in advanced and specialized courses**

   At least 30 course credits in advanced and specialized courses—courses numbered 300 or higher, excluding courses numbered 900 (contract learning)—must be satisfactorily completed at or under the sponsorship of UMass Dartmouth.

8. **Have a cumulative grade point average of at least 2.000**

   A cumulative grade point average of not less than 2.000 for all credits submitted for the degree must be attained.

9. **Complete 120 credits of courses (minimum—some programs require a higher number of credits for the degree)**

   The requirement to complete 120 credits of courses is a minimum. Some programs require a higher number of credits for the degree.

Department or College Requirements
Academic requirements more restrictive than or in addition to UMass Dartmouth requirements may be established for any major or program.

Other Program Options

In addition to pursuing an academic major, many students will also work towards a certain goal, such as preparation for teaching, entrance to law school or medical school, or certification in a certain area of studies. Such options are described in other places in this catalogue. In addition, students may pursue a double major or a minor. A growing list of departments are facilitating access to a master's degree through a combined bachelor's/master's program.

Double Majors
By being accepted into and fulfilling the requirements of two majors, a student may graduate with one degree and two majors, or two degrees. Both majors are deemed to be of equal importance, and students must fulfil all requirements for both degrees. When the choice of two majors would result in the award of two degrees, for example, a BS and a BA, requirements for both must be met not only in major course work but in distribution requirements, general education requirements, and a language requirement if applicable. Students requesting special considerations regarding requirements beyond those of the specific major, such as in general education, need to receive approval from officials of the departments/colleges of both majors. If a student who is pursuing a double major decides to graduate before completing requirements of both majors, s/he will be subject to the requirements for Readmission to Complete a Second Bachelor's Degree covered later in this section; recently, hardship waivers to this rule have been permitted by the college dean or deans concerned.

Combined Bachelor's/Master's Programs
According to a new policy, some academic departments may announce combined bachelor's/master's programs allowing well-qualified undergraduates to move directly to master's level study in the same department. The policy permits curricular designs allowing up to 15 credits of coursework to count for both the bachelor's and master's level, thus reducing the total credits required to earn both degrees.

Academic Minors
Qualified students may complete an academic minor. Approved minors consist of at least 18 credits, of which 9 must be at the upper division level. The university's minimum requirement for access to a minor is that the student must be a degree candidate who has earned at least 54 credits, with a cumulative grade point average of 2.000 and with a 2.500 grade point average in the major. A department offering a minor may establish other requirements beyond these minima. The same course may count both for a minor and for distribution or general education requirement, but not also as a major requirement.

Specific minor-program requirements are stated in the program sections of this catalogue. Successful completion of a minor will be so noted on the student's transcript.

General Education Requirement

The current General Education program was initiated in Fall 1998, with a phase-in process between that date and fall 2000.

To qualify for graduation, students must meet the General Education Requirement by means of an appropriate selection of courses. The table to the right summarizes the requirements.

Goal of General Education
The goal of UMass Dartmouth's General Education program is to educate students to be not only proficient in their areas of specialty, but also

- to have a working understanding of the connections between disciplines;
- to appreciate and respect the differences among ourselves;
- to be ethical, culturally-aware, and socially-responsible citizens;
- to be quantitative and rational thinkers; and
- to be effective and creative communicators.

Information about General Education
The *approved lists of general education courses and categories* are made available every semester in the published *Course Listings* booklets that give the schedule of classes.

The code symbols from the chart in the next column are also shown in the course descriptions of the *General Catalogue* to identify all courses that have received "permanent designation" as counting for one or more of the general education areas.

A few courses apply toward a category of general education only in certain years or depending on the instructor assigned to teach them; these courses, which receive "contingent designation," are identified only in the *Course Listings* booklets.

The General Education Committee is actively at work helping the campus community to implement these requirements and approving additional general education course requirements.

General Education Area	*Code*	*Qualifiers*
Cultural & Artistic Literacy 9 credits	**C**	All regular courses from the departments of history, philosophy, foreign language, and English (literature and creative writing courses only); and from the College of Visual and Performing Arts. No more than 6 credits from the same department
Ethics & Social Responsibility 3 credits	**E**	A course which has at least 12 instructional hours in ethics and social responsibility, from the approved list OR A departmental major or college requirement (course or sequence of courses) which has at least 12 instructional hours in ethics and social responsibility, as approved for that unit
Global Awareness & Diversity 6 credits	**G** AND **D**	A three-credit course in global awareness, from the approved list; A three-credit course in diversity, from the approved list
Information & Computer Literacy 6 credits	Tier 1 AND (Advanced, Tier 2) **I**	English 101 and 102, incorporating computer-based assignments and library instruction Department-specific advanced literacy skills, as approved for that unit (credits unspecified).
Mathematics, Natural Science, and Technology 9 credits	**M** AND **S**	A three-credit course from the department of mathematics (non-remedial) Six credits from . . . (a) all regular courses from the departments of biology, chemistry, medical laboratory science, civil and environmental engineering, computer and information science, electrical and computer engineering, mechanical engineering, and physics; OR (b) other courses which emphasize fundamental scientific concepts or application of scientific methods in critical thinking and problem-solving in the natural sciences, from the approved list
Written & Oral Communications Skills 9 credits	Tier 1 (Advanced, Tier 2) **W** **O**	English 101 and 102 *AND* Three credits in a writing-intensive course from the approved list. The curriculum is to be designed so students complete this course before the student's senior year. *AND* At least two formal oral presentations in one or more courses designated by the student's major department and approved for that unit (Tier 2 oral communications)

Courses that meet these requirements are coded in the departmental course listings of this catalogue.

Gen Ed and Transfer Credit
Course equivalencies are determined in the transfer credit approval process. If a course from elsewhere is found equivalent to a UMass Dartmouth course or category of courses that satisfies a general ed requirement, the transferred-in course will satisfy that same requirement. For courses that do not have exact equivalency to a UMass Dartmouth course, those who make transfer credit decisions have discretion to make judgments that another school's course meets one or more of our general education requirements.

Relation to Other UMass Dartmouth Requirements
General Education course requirements take their place beside other requirements, as outlined in the section on Undergraduate Degree Requirements, rather than replacing any other graduation requirements. Students are alerted especially that the general education requirements and the distribution requirements for their major and college are not necessarily the same; *both* sets of requirements must be satisfied.

However, any courses used in satisfying a general education requirement may also be used to satisfy other kinds of requirements.

That is, Gen Ed is an "overlay" requirement, not a separate requirement.

For example, some courses used for general education will often also meet requirements for the major. Other general education courses may meet the "distribution requirements" established by the colleges of the student's major.

Can One Gen Ed Course Satisfy More Than One Gen Ed Requirement?
In the case of *content* courses that can satisfy different General Education content requirements, a student can use such a course only to satisfy one such requirement. For example, if a course is listed as satisfying both the Global Awareness and Diversity requirements, a student can use it to satisfy only one of those requirements.

When a general education content course has also embedded within it a unit or attribute that satisfies a *skills* area requirement (that is, when a C, D, E, G, M, or S course is also identified as I Tier 2, W Tier 2, or O), it may be used to satisfy or contribute toward satisfying both requirements. Similarly, a single course may be identified as satisfying more than one skills attribute.

General Education Requirements

Code letters are used in the Course Catalogue to identify general education areas each course is approved for.

Area C	Area E	Area G		Area I		Area S		Area O	
				Information and Computer Literacy				Writing Skills		
Cultural and Artistic Literacy	Ethics and Social Responsibility	Global Awareness	Diversity	Basic requirement	Advanced major course(s)	Mathematics	Natural Science and Technology	Writing -intensive course	Basic requirement	Oral Skills — at least 2 formal oral presentations
Code C	Code E	Code G	Code D	—	Code I	Code M	Code S	—	Code W	Code O
9 credits	unspecified	3 credits	3 credits	6 credits	unspecified	3 credits	6 credits	(6 credits)	3 credits	unspecified
Courses from: *College of —* Visual/Perf. Arts *Depts. of —* For. Lit. and Lang. History Philosophy Portuguese English — only literature and creative writing *Other courses from:* approved list No more than 6 credits may be from one dept.	Depts. may specify course or sequence or utilize approved list *Consult dept.-specific lists for your major, and approved list*	*Courses from:* Approved list	*Courses from:* Approved list	ENL 101 ENL 102 Both include computer-based assignments and instruction Also satisfies Area W, Tier 1 requirement	Depts. will specify course or sequence *Consult dept.-specific lists for your major*	*Courses from:* Dept. of Mathematics only	*Courses from:* *Depts. of* Biology Chemistry Civil Enrg. Computer Sci. Electr. Enrg. Genrl. Engr. Med. Lab. Sci. Mech. Enrg. Physics *Other courses from:* approved list	ENL 101 ENL 102 Also satisfies Area I, Tier 1 requirement	Depts. may specify course or utilize approved list *Consult dept.-specific lists for your major, and approved list* Note: this requirement is to be met before the student's senior year.	Depts. will specify course or sequence *Consult dept.-specific lists for your major*

Courses excluded: experiential learning/internship; independent study/research; directed study; developmental/remedial; graduate; and courses taken Pass/Fail.

Academic Advising at UMass Dartmouth

Roles of the Academic Advisor

UMass Dartmouth's faculty take their obligation to advise students seriously. Students consult their advisors for assistance in —

- forming their academic goals and career objectives
- establishing an overall plan for their program of study
- understanding and meeting degree requirements, requirements in the specific academic program or major, distribution requirements and college requirements, and general education requirements
- understanding academic regulations and procedures
- monitoring their progress toward completion of their degree
- identifying campus services appropriate to their needs
- planning for any special programs like an experiential learning experience or study abroad
- responding to academic difficulties.

Students must see their advisor before they register each semester. In this contact, the advisor should review the student's academic progress, review the student's career plans, and assist the student in selecting the next semester's courses. The advisor must sign to approve the student's course selections before the student registers; in many cases, the advisor can register the student directly from his or her office.

Students may see their advisor at other times. The advisor can call a conference with the student at any time, with reasonable notice. The first stop for students who receive notice of academic warning or probation should be the office of their advisor (see below, the section on "Academic Sanctions").

The Academic Advising System at UMass Dartmouth

Every degree candidate has an assigned individual faculty member who serves as his or her academic advisor.

The student's major program determines the assignment of the faculty academic advisor. The academic department assigns each student to an academic advisor, except in certain special cases noted here —

- Students who have selected Liberal Arts as their initial program receive academic advising in the Academic Advising Center.
- Freshman students in certain majors—like Business—may receive academic advising from faculty selected from their college, located in the Academic Advising Center.
- Freshman students in the studio arts receive academic advising through a special orientation course and program provided in their College.
- Students pursuing their degree in the Division of Continuing Education receive academic assistance from qualified staff members, who provide a link between each student and the academic department of their major.

New students, be they incoming freshmen or transfer students, will meet their advisors at the New Student Orientation program.

In many academic majors, the student retains the same academic advisor throughout the program. In others, students change their advisor as they progress in their degree program.

In certain circumstances, a student will work with an advisor in addition to her or his main advisor—for example, if pursuing an academic minor; a special program such as teacher preparation, pre-medical, or pre-law; or cooperative education. When a student has a double major, s/he will have a different advisor assigned for each major.

Students have an obligation to know who their advisor is and to contact that advisor when required or when needing assistance. At the same time, each academic department has an obligation at the beginning of every semester to post in a conspicuous place the faculty advising assignments for each major student in the department. All members of the faculty must have scheduled conference hours posted on their office doors and are expected to be available during those hours to advisees; in addition, students may schedule appointments with their advisors at other times.

Because the department chairperson, not the advisor, must approve each student for graduation, the department chairperson or designee should review the record of each major in the department at the point of completing 90 credits, or three-quarters of the requirements for the degree. The department chairperson or designee is responsible to inform the student of requirements that remain unfilled.

As partners with their faculty advisors in the advising relationship, students have the final responsibility to understand the requirements for their majors and degrees and the policies of the university. Each student is given a copy of the General Catalogue in effect for the year of their entrance to degree study.

Students needing assistance with the advising system should go either to the office of the Chairperson of the department of their major or to the university's Academic Advising Center. A current list of academic department locations and phone numbers is published annually in the Student Handbook, which is given to every student each year. The Academic Advising Center, described above in the chapter on Campus Services and Support, will consult with any student on a walk-in basis and provides special guidance to those considering changing their major.

The Dean of each College has ultimate responsibility for the academic advising system for the students in the programs in his or her College.

Statement of Final Responsibility

Although faculty advisors and many others seek to guide and assist each student, it is the student—not the faculty advisor, department chairperson, or other university official—who is ultimately responsible for seeing that his or her program fulfills degree requirements.

Academic Advising Goals and Emphases

The Faculty Senate has adopted the following "Academic Advising Policy Statement" to encourage faculty in the philosophy and practice of developmental advising.*

The functions of academic advising at UMass Dartmouth include:

1
Assisting students in self-understanding and self-acceptance (value clarification, understanding abilities, interests and limitations).
2
Assisting students in their consideration of life goals by relating interests, skills, abilities, and values to careers, the world of work, and the nature and purpose of higher education.
3
Assisting students in developing an educa-

tional plan consistent with life goals and objectives (alternative course action, alternate career considerations, and selections of courses).
4
Assisting students in developing decision-making skills.
5
Providing accurate information about institutional policies, procedures, resources, and programs.
6
Making referrals to other institutional or community support services.
7
Assisting students in evaluation or reevaluation of progress toward established goals and educational plans.
8
Providing information about students to the institution, colleges and/or academic departments.
9
Facilitating the students' successful attainment of educational and career goals.
10
Facilitating the students' achievement of GPAs consistent with their abilities.
11
Making students aware of the wide range of services and educational opportunities that may be pertinent to their educational objectives.
12
Assisting students in exploring the possible short-and-long range of consequences of their choices.
13
Assisting students in choosing educational and career objectives commensurate with their interests and abilities.

* Adopted from the National Academic Advising Association.

Advising for Non-Degree Students or Prospective Students
Students who wish just to take a course or courses without being in degree status may receive assistance at the Academic Advising Center.

Such individuals may study at the university in non-degree special student status. The faculty advisors in the Academic Advising Center welcome contacts from such students and assist them in formulating their goals of study.

Students considering admission to degree study, either full or part time, should contact the Office of Undergraduate Admissions.

Role of the Deans of the Five Colleges
Students may consult the office of the Dean of their College for information or inquiries about the departmental programs or academic requirements, regulations, and processes. A role of the Deans is to approve special academic petitions and requests or to waive an academic regulation, due to hardship or special conditions. Another role is to give assistance with any student's concerns, or to handle complaints and special appeals.

Statement on Outside Work

The University of Massachusetts Dartmouth is committed to delivering the highest quality education to all of its students. In this context, we believe that for each credit, students should expect at least three hours of related academic work outside of class. While the campus is appreciative of the necessity of students having outside employment, full-time students should think carefully about the number of hours they spend in outside employment. Faculty members offer students a workload that challenges students to get the most out of their educational experience. Each student at the University registered for 15 credits should expect at least 60 hours of academic work per week.

Course Credits
Courses are the basic units of teaching at UMass Dartmouth. A course is a segment of an academic or professional field which provides insight and understanding of those topics, skills, and approaches to knowledge which are determined by the University to be important to students' educational development, personal growth, and/or career preparation.

Each course at UMass Dartmouth carries the number of credit hours specified in the course description. Lecture/discussion courses ordinarily meet three hours per week in each semester. There is, however, a wide range of hour and credit arrangements, ranging from one-credit laboratories to 15-credit practice teaching courses. Consult the chapter on "Other Learning Opportunities" for further variations.

Course Load
Full-time load: An undergraduate student is deemed to be in full-time status during a semester if carrying 12 or more credits. A graduating senior in the final semester may be considered full time with fewer credits, thus maintaining financial aid status. Some financial aid programs may be reduced if enrollment is for fewer than 12 credits. Please confirm awards with the Financial Aid Services Office.
Maximum load: Undergraduate degree candidates who wish to register for more than 18 credits in a semester must obtain approval of the appropriate dean. A student may accumulate a maximum of 30 credits in excess of degree requirements.

Course Level and Number System
Courses are listed by number and title. Courses are numbered according to the following system:

100-level—introductory courses

200-level—intermediate courses

300/400-level—advanced and specialized courses normally requiring prerequisites; including seminars, honors, practica, theses, and independent study

500/600/700-level—graduate courses. Open to undergraduates only with permission. Some programs prohibit undergraduates from registering in 500/600-level courses.

Courses may be offered that do not give credit toward graduation but count in

calculating a student's load ("administrative credit"). Usually, these courses are numbered 100 or lower (e.g., Math 100).

Repeating of Courses
Students may repeat individual courses once, but only if space is available and with the written consent of their department chairperson and their advisor. Students who wish to take the same course a third or subsequent time may be permitted to do so only after obtaining written permission from the instructor, from the academic advisor, and from the chairperson. It is the student's responsibility to follow this procedure since instructors may remove names of students from the class roster who have not received permission to attend the class.

Only the appropriate UMass Dartmouth course may be used; no course taken at another institution can replace a UMass Dartmouth course's grade. Only the most recently earned course grade (whether higher or lower) shall enter into calculation of the cumulative grade point average. However, all courses attempted by a student will be part of the permanent record.

Transfer of Credit from Other Institutions

The detailed practices in transfer of credit by incoming students are stated above, in the chapter on Admission to the University, in the section called "Advanced Standing through Transfer Credits."

A current UMass Dartmouth student who wishes to enroll in courses in another university or college for transfer credit to UMass Dartmouth should have such courses approved in advance by the appropriate department chairperson and college dean in order to insure the transferability of such credits. A form is available for this purpose, and assistance may be sought at the Academic Advisement Center.

On completion of the courses, an official transcript should be forwarded to the UMass Dartmouth Registrar. A C- grade is the minimum acceptable grade for receiving undergraduate transfer credit at UMass Dartmouth. Transfer coursework for which credit is given will be recorded on the student's permanent record card without a grade designation. It will not be calculated in the student's grade point average.

Certain courses completed at another institution are, by prior arrangement, deemed to count as UMass Dartmouth credit. Examples include courses taken in Study Abroad, in formal Exchange status, and in special arrangements whereby another institution's courses are identified as receiving UMass Dartmouth credit (for example, if taken within a formal joint program between or among UMass campuses). Grades earned in such courses are displayed on the UMass Dartmouth transcript and affect the student's grade point average.

Registration
Registration is the process by which students enroll in courses each semester. Returning students are responsible for registering during the established registration period. New and transfer students and re-admitted students register according to the most recent instruction from the Office of the University Registrar. Registration will not be considered effective until all financial obligations to UMass Dartmouth are met.

Add/Drop
Up to the end of the first week (five class days) of the semester, a student may officially Add courses or Drop courses without record. In the case of courses that meet only once a week, the Add/Drop period shall be two weeks. No one shall enroll for Experiential Learning, Independent Study, and Honors Thesis credits after the second week (ten class days) of the semester without the permission of the appropriate dean or a designee.

Withdrawal from Courses
Students may withdraw from a course only through the end of the tenth week of classes of the semester. A grade of W will be recorded.

More than 24 credits of W makes the student subject to dismissal from the University through the action of the Dean of the student's College. Grades of W do not affect a student's GPA.

A student who withdraws from *all* courses shall be deemed to have withdrawn from the university.

Class Attendance
There is no University-wide attendance policy. Students are expected to be present at all scheduled activities related to courses in which they are enrolled and are responsible for the course work and assignments missed during any absences. They must take the initiative in making up any work missed and finding out about any assignments made during their absence. Extended absences for medical or personal reasons should be reported to the Office of the Dean of Students.

Individual faculty members are responsible for informing students of the attendance rules for each class and the penalties for violating them. Faculty members are solely responsible for the enforcement of these rules.

A class session is considered canceled if the instructor does not report within ten minutes from the beginning of the class period.

Absence for Religious Observance
Students have the right to make up examinations, study, or work requirements that they miss because of absence from class for religious observance, but they also have an obligation to inform the course instructor as to the days on which they will be absent for religious reasons. Students should inform the course instructor in writing of the days they will be absent as early as possible in the semester and always prior to the day(s) the student will be absent for religious reasons.

If they feel that it is important for course planning, instructors have the right to require students to provide a written list of days they will be absent for religious observance within one full week after the students' enrollment in the course, provided the instructor lists this requirement and corresponding deadline on the course outline or other handout.

In the event of a dispute about religious observance between a faculty member and a student, the chairperson of the department in which the course is taught shall be responsible for its amicable resolution. If the dispute cannot be resolved at this level, the issue will be referred to the dean of the college in which the course is taught.

For convenience, a listing of major days of religious observance is given at the end of this chapter.

Change of Major or College
Students requesting a change of major will be expected to meet entrance requirements of the new major. Access to majors may be limited.

Requests for change of academic major or college must be approved by the department chairpersons involved and the dean of the college to which the student is transferring. The change of major form is obtained in the Registrar's Office and the Academic Advising Center.

Study Away/Study Abroad Status
Students who undertake formal study experiences such as study abroad, internships, clinicals, or cooperative education placements at a different institution or off-campus setting may retain enrolled status at UMass Dartmouth and, in some cases, be eligible to receive UMass Dartmouth financial aid. Such study must be under the sponsorship of UMass Dartmouth, be an approved element in the student's degree program, and receive approval from the department, dean, and Academic Advising Center, which serves as the contact-point for requesting this status. Amounts and types of aid may vary depending on the type of program, length of study, and program costs.

Leave of Absence
A student may request of the appropriate college dean a leave of absence for a period no longer than two calendar years. Students on leave of absence may return within the stipulated period by writing to the college dean at least four weeks prior to the first day of classes in the semester of return. The college dean may specify an earlier notification deadline in limited enrollment programs. Students on leaves of absence who exceed their stipulated time on leave will be considered to have withdrawn and so will be subject to the re-admission procedures, below.

Students on leave are not considered enrolled.

Re-admission After Interruption of Study
Former students may request re-admission to continue undergraduate work, after an absence longer than that covered by an approved leave of absence or after an absence for which they did not obtain an approved leave. Re-admission requests are submitted to the Registrar, who forwards the request to the dean of the college of the student's major. A modest fee is charged to each applicant for re-admission.

An individual's re-admission is not automatic; some re-admission requests are denied. The individual is evaluated for academic progress and for availability of space in the major program and must receive Bursar's clearance. Applicants who wish to be re-admitted in a different major or who were not making satisfactory progress when they withdrew receive a special scrutiny at the departmental and dean's level. "Satisfactory progress" in the phrase above refers to students who were neither dismissed from the university for academic reasons nor on academic probation at the time of withdrawal.

Grades Amnesty Policy
Grades Amnesty can be described as a means of conferring on our own students the benefits that transfer students receive. Grades Amnesty is intended to permit the readmission of formerly unsuccessful students who present evidence of motivation and ability to succeed if readmitted to the university. When such a student requests readmission, s/he declares an intention to invoke the amnesty policy. In addition to permitting readmission when a student's prior performance might not merit it, Grades Amnesty allows previous poor grades to be removed from the cumulative grade point average later, if certain conditions are met.

Students interested in readmission under this policy must first contact the Academic Advising Center to begin the process. Grades Amnesty is invoked at the time of readmission and approved by the readmitted student's advisor, chairperson, and dean. With the advisor's assistance, the student must set academic goals carefully not only ultimately to achieve grades amnesty but to avoid or minimize probation and prevent future academic dismissal.

Requirements for a student to be considered for readmission under Grades Amnesty, and conditions for initial semesters:

- The student must have been matriculated in an undergraduate degree program at UMass Dartmouth or a predecessor institution.
- The student must have left the university at least 5 years previously with a cumulative grade point average below 2.500.
- The student must present evidence of motivation and ability to succeed if readmitted to the university; for example, the student could show good grades earned in some subsequent college courses.
- The student will be subject to graduation requirements in effect at the time of readmission.
- Once a student has accepted readmission under Grades Amnesty, s/he may not reverse that decision and is subject to its conditions.
- With two exceptions, all the usual Probation and Dismissal rules will apply to the readmitted Grades Amnesty student. Exception (1): Academic dismissal will not occur after the student's first semester back. Exception (2): Readmitted Grades Amnesty

students may not, during their first semester back, serve on university committees, hold leadership positions, or represent the university in intercollegiate athletics. Beyond their first semester, all regular Probation and Dismissal rules apply. Thus, if probation is earned after the first semester back, it shall be so noted and will again prevent the student from engaging in activities as above. A readmitted Grades Amnesty student can be subject to dismissal after the second semester back.

Requirements for previous grades to be removed from the cumulative grade point average under Grades Amnesty:

- The student must have been readmitted to matriculated degree status and be still a matriculated degree-seeking student.
- The student must have completed at least 45 credits since returning, with a cumulative grade point average of at least 2.500.
- All courses and grades attempted and earned in the prior period of enrollment will remain a part of the student's permanent record along with academic notations. However, none will be calculated into the student's cumulative grade record and will be so annotated on the record.
- Courses passed in the prior period of enrollment with grades below C- will not be accepted toward satisfaction of any degree requirements following readmission, nor will the credits previously earned in them be credited toward the degree.
- Courses passed in the prior period of enrollment with grades of C- or better may be accepted towards satisfaction of major requirements if so approved by the department, but still are not calculated in the cumulative or major grade point averages.

Withdrawal from the University
A student who wishes to withdraw from UMass Dartmouth should file a Withdrawal Notice Form with the Registrar, who will inform the dean of the student's college. Failure to follow this procedure will jeopardize the student's re-admission. A student who officially withdraws shall receive a W in each course as appropriate (see Grading System). If a student does not reenter the University in the following semester but plans to at some later time, he or she should apply for a leave of absence.

Veterans who withdraw are urged to consult the office that assists with veterans' affairs.

Full-time undergraduate degree candidate students who withdraw separately from all class sections in which they were enrolled in a term are deemed to have withdrawn from the university.

Students may withdraw from the university and receive "W" grades through the end of the final day of the official instructional period for that term or semester. If they withdraw after the final examination period has commenced, they are subject to standard grades for that term.

Withdrawal from the university can have consequences regarding need-based financial aid. Students who withdraw from the university before 60% of the semester is completed will have their Federal financial aid eligibility recalculated in direct proportion to the length of the enrollment. The percentage of time the student remained enrolled is that student's percentage of dispersible aid for the semester. A student who remains enrolled beyond the 60% point earns all aid for the period. Withdrawal is recorded by the Office of the University Registrar in accordance with UMass Dartmouth withdrawal policies. More complete information is available from the Financial Aid office or web site.

Re-admission to Pursue a Second Bachelor's Degree
Individuals who received a bachelor's degree from UMass Dartmouth or a predecessor institution may request re-admission to pursue a second bachelor's degree. As above, these requests are submitted to the Registrar, who forwards the request to the dean of the college of the student's intended new major. Such a student will complete at least 30 additional credits at UMass Dartmouth, and will complete all courses required for the second degree, including any prerequisite or deficiency courses not previously completed satisfactorily. Such a re-admitted student will be considered a regular degree-seeking student and be subject to major program requirements and the university's academic policies and procedures.

Re-admission to pursue a second degree is not automatic; some re-admission requests are denied. The individual is evaluated for academic qualifications and for availability of space in the major program.

Students with a bachelor's degree from a different institution may seek admission to UMass Dartmouth to pursue a second bachelor's degree through the university's Office of Undergraduate Admissions. Such students, upon admission, will be required to complete at least 45 credits at UMass Dartmouth, meeting the terms of the university's undergraduate residency requirement, given earlier in this chapter.

Re-admission to Pursue a Non-Degree Course of Study
Former students who wish to return to UMass Dartmouth to earn a certificate or take courses not applied toward a degree should seek acceptance as non-degree special students, in a process described earlier in this chapter. Many options are available, from selecting courses for personal interest or benefit to entering one of the university's formal certificate programs, described below in the chapter on Interdisciplinary and Special Programs.

Admission to graduate level post-baccalaureate certificate and graduate programs is obtained through the Office of Graduate Studies.

Grades and Grading System

Grades are determined and assigned by Instructors according to the guidelines indicated below. Each student's academic achievement and fulfillment of degree requirements are reflected in the transcripts which are issued at the end of each semester.

The UMass Dartmouth grading system includes plus and minus grades which are used in computing grade point averages.

The grading system used specifically for undergraduate courses includes the following letter grades and quality points:

A Excellent
Quality Points:

A+	4.000
A	4.000
A-	3.700

B Good
Quality points:

B+	3.300
B	3.000
B-	2.700

C Satisfactory
Quality Points:

C+	2.300
C	2.000
C-	1.700

D Marginal
Quality Points:

D+	1.300
D	1.000
D-	0.700

D- is the lowest grade acceptable for credit.

F Unsatisfactory
Quality Points: 0
Failure to meet minimum standards either on the basis of work submitted or not submitted. No credit awarded. 0 quality points awarded for purpose of computing GPA credits as indicated in course description.

F(I)
Quality Points: 0
An F assigned for failure to complete a course within a year after the assignment of an I notation.

W
Official withdrawal by the student from a course after the Add/Drop period, and up to the completion of tenth week of the semester. No credit awarded. W grades do not affect a student's GPA

CR
A passing grade. Credit given upon satisfactory completion of a Cooperative Education semester or a contract under the Experiential Learning program. Not included in grade point average. This grade may also be assigned as a passing grade under grade appeal procedure.

NC
A failing grade. Under Cooperative Education or Experiential Learning program, no credit awarded. For purposes of computing GPA credits as agreed upon by contract.

I
Work Incomplete. May be given only in exceptional circumstances at the instructor's discretion and at the student's request made no more than 48 hours after the final examination or last class. The student must be passing at the time of the request or must be sufficiently close to passing for the instructor to believe that upon completion of the work the student will pass the course. If the work is not completed within a year of recording of the I, the grade will become an F(I). "I" grades cannot be changed to W.

P
Passing. The P grade is recorded for grades of A, B, C, or D, under the pass-fail option. The grade of P may also be used for satisfactory completion of courses that do not carry graduation credit. Not figured in grade point average.

IP
In Progress. Notation used in special cases to indicate that academic progress covers more than one term; e.g., that a grade will be assigned on the completion of the task involved. The "IP" notation is replaced upon receipt of the official grade. Until or unless replaced by an official final grade, the notation "IP" will remain on the transcript.

NR
Grade not reported by instructor at time of grade processing. "NR" is not a permanent grade.

F
Under pass/fail option. See "F" definition above. No credit awarded. 0 quality points awarded, for purposes of computing GPA Credits as indicated in course description.

AU
Audit. This notation is used when a student sits in on a course for personal or educational enrichment but receives no evaluation and takes no examinations. No credit is awarded. Audited courses do not count toward a student's semester credit load. Auditors must register for the course, first receiving permission of the instructor, no later than the end of the add-drop period. Normal tuition and fee charges apply. Notation of auditing is posted to the academic record.

Pass/Fail Option
Sophomores, Juniors, and Seniors may select a Pass/Fail Option for one course per semester (up to a maximum of four courses), except in the following cases:

- any course specified as a degree requirement;
- any course in a student's major, unless the department rules otherwise;
- any course used to satisfy general education requirements or the distribution requirements of the degree program in which the student is enrolled.

Pass/Fail is not available to graduate students.

Selection of Pass/Fail Option
Students will be given through the first five weeks of each semester to exercise the option, which shall then be irrevocable. Only the student and the Registrar shall know that the option has been selected. Grading practice, vis-a-vis faculty and students, will be identical to the usual marking procedure.

The burden of selecting a proper course under Pass/Fail rules shall be borne by the student. Any doubt whether a course is a degree requirement and so not eligible for Pass/Fail shall be resolved by consultation with the dean of the college in which the student is enrolled. If the course chosen *is* a degree requirement, then the student will be subject to the usual marking practices.

Pass-Fail Grading
Grading practices under this option are as follows:

- A Pass/Fail student who does passing (i.e., A through D-) work in a course shall be given a grade of P (Pass). Passing a course shall earn a student graduation credits but shall not be counted in the cumulative average. Failure in a course will be 0 quality points and will be counted in the GPA

•
The Registrar shall be required to keep a separate record of the grades obtained in the Pass/Fail courses and will issue this record only on the request of the student.
•
The transcripts will contain the Pass/Fail notation, but the grade actually achieved will be kept on file in the Registrar's Office.

Scholastic Standing
A grade point average (GPA) is determined for each student at the end of each term's program of courses. A GPA is computed by multiplying the credit of each UMass Dartmouth course by the quality points of grade received in that course. The sum of the above is then divided by the total number of credits in courses in which the student enrolled. Grades of P, CR, I, W, WP, WF, IP, AU are not included.

A cumulative grade point average is the average of all the UMass Dartmouth grades other than of P, CR, I, W, WP, WF, IP, AU, of the student. Grades of F, F(I), and NC earn zero quality points. Such grades are included in the student's average according to the number of credits specified in the course description.

Change of Grade
Whether for a one- or two-semester course, the grade received at the end of each semester stands as the final grade for the semester. For certain special coursework (honors, research programs, etc.) in which it is extremely difficult to assess academic progress on the basis of one term, the notation "IP" (In Progress) is acceptable on an interim basis. The "IP" notation is replaced upon receipt of the official grade. Courses for which the "IP" grade is used are so identified in the course description.

The statute of limitations on all grade change requests is one year from the date that the grade was placed on the student's record. In extreme and exceptional cases, on request of the student and recommendation of faculty, the instructor and/or the appropriate college dean may authorize changes in grades given over one year from the date the grade was assigned.

Grade Appeal
Grade appeals are pursued through a formal process, which is conveyed in the university's Grade Appeal Policy. Copies of the full policy and an outline of procedures are available in the offices of the college deans, at the Academic Advising Center, and at the Office of Academic Affairs. The following paragraphs summarize the grade appeal process.

A faculty member is identified to act as a Grade Appeal Facilitator, who will offer advice to both students and faculty about how to prepare for and conduct their respective roles in the process.

Only final course grades may be appealed. For the purposes of appeal a final grade may be alleged to be (1) unfair because of the unequal application of grading standards within the course section, or (2) in error because of a clerical or computational error. An appeal may be pursued only if there is a valid basis and evidence for it, and the collection of evidence to support an allegation is the obligation of the student. Students will attempt to resolve differences first through informal and amicable discussions with the faculty member or through the good offices of the Grade Appeal Facilitator.

Grade appeal should be perceived as a "last resort" after other attempts to resolve the issue have failed.

Formal appeals are addressed in writing to the Grade Appeal Facilitator and must be initiated within the first 20 class days of the following semester, excluding summers, or within 25 working days from the date that the grade report is mailed out from the Registrar's Office, whichever is later.

Responsibility for initiating an appeal rests with the student who received the disputed grade. Responsibility for developing and presenting evidence that the grade given is unfair or in error rests with the student making the appeal.

Class Standing

Freshman/First Year: Up to and including 29 credits or 1/4 of graduation credit requirements in the student's degree program.

Sophomore/Second Year: From 30 to 59 credits or 1/2 of graduation credit requirements in student's degree program.

Junior/Third Year: From 60 to 89 UMass Dartmouth credits or up to 3/4 of graduation credit requirements in student's degree program.

Senior/Fourth Year: More than 90 credits or more than 3/4 of graduation credit requirements in student's degree program.

The university's computer system will identify students' class standings by credits completed—freshman, through 29; sophomore, 30 to 59; junior, 60 to 89; senior, 90 or above. Students may request a calculation by hand if the standard calculation is wrong for their program.

Academic Recognition and Academic Honors

Dean's List
Following the completion of each semester, full-time undergraduate degree students (in both "day" and Continuing Education) who have completed at least 12 course credits, excluding courses taken under the Pass-Fail option and Experiential Learning, and who have no "I" grades outstanding for that semester, are considered for the Dean's List and the Chancellor's List for that semester. Those who achieved a grade point average of at least 3.200 will be named to the Dean's List for that semester. This accomplishment will be noted on the student's transcript.

Part-time students who meet the above criteria in the just-completed semester together with the semester or term just preceding it, may receive the same recognition if the total credits completed in the two terms are at least 12 and the combined grade point average for those two semesters is at least 3.200.

Chancellor's List
Under the same limitations as for the Deans' List, those who achieve a GPA of 3.800 or better for a given semester will be named to the Chancellor's List rather than the Dean's List. This accomplishment will be noted on the student's transcript.

Part-time students who meet the above criteria in the just-completed semester together with the semester or term just preceding it, may receive the same recognition if the total credits completed in the two terms are at least 12 and the combined grade point average for those two semesters is at least 3.800.

Graduation with Distinction
Students are eligible for graduation with distinction provided they achieve a cumulative grade point average in all of their UMass Dartmouth credits of:

3.200 to 3.499	Cum Laude (Distinction)
3.500 to 3.799	Magna Cum Laude (High Distinction)
3.800 to 4.000	Summa Cum Laude Highest Distinction).

Graduation with "Cum Laude," with "Magna Cum Laude," or with "Summa Cum Laude" is inscribed on the student's diploma. Graduation with distinction is based on all UMass Dartmouth work including the final semester.

University Honors Program

University-wide honors activities are available to full-time undergraduate students who demonstrate high academic achievement. University Honors Programs are designed to:

- provide a forum for the discussion of topics of academic interest along interdisciplinary lines;
- offer departmental and interdisciplinary honors courses; and
- recognize those students whose academic accomplishments are outstanding.

Students with an excellent academic record receive an invitation also to participate in the Honors Colloquium, an Honors Essay Contest, and other events that recognize the achievement of honors students.

For further information contact the office of University Honors Programs located in Room 339 of the Group I Building, x8277.

Students with a minimum GPA of 3.200 may enroll in available introductory level honors sections of courses such as history, sociology, psychology, English, chemistry, philosophy, biology, and business. Students applying for admission to UMass Dartmouth with test scores and/or high school records which predict university performance at honors level will also be invited to enroll in honors sections, and nominations from high school counselors or teachers of their creative, high-potential students are welcome.

For continuation in the program students must maintain a minimum GPA of 3.200 in honors courses and 3.200 in all course work. Those who complete the full University Honors Program earn the designation *Commonwealth Scholar*. Required are:

- completion of at least 12 credits of honors courses outside the field of the student's major
- completion of HON 201 Multidisciplinary Approaches to Research and Writing
- completion of 9 credits of honors coursework in the student's major, including an honors thesis
- completion of 6 additional credits in honors work.

Departmental Honors
Several Departments offer to qualified students a special curriculum leading to Honors in the major field. Students satisfactorily completing the departmental requirements for Honors in the Major will, upon graduation, have their diplomas so inscribed and be so designated on the graduation program. Departments will notify all eligible candidates by the end of their Junior year. Potential participants shall follow departmental guidelines for entry into the Honors program.

Participants shall have a minimum GPA of 3.000 for all course work. Departments may require higher minima and, in addition, may set minimum GPA s in the majors. GPA s will normally be determined after the fifth semester.

Departmental Honors Programs will include an appropriate end product, normally a project or thesis. A maximum of six credit hours may be awarded for completion of the project/thesis. Departments shall develop procedures for approval of participants' proposals. A faculty sponsor or honors advisor shall advise an honors candidate, according to departmental or program guidelines. An evaluation committee, which shall be multidisciplinary in nature, shall be established according to departmental or program guidelines. This committee shall evaluate the completed honors project/thesis and determine if the work meets standards for honors.

Academic Sanctions

Academic Warning
Any student having a semester grade point average below 2.000 at the conclusion of any term shall be issued an academic warning. Such warning will be available to the student's dean, department chairperson, an academic advisor, or, in the case of students who have yet to declare a major, to their advisors of record and to the Academic Advising Center. (In cases of concurrent "day" and DCE enrollment, the semester GPA will combine the two.)

Students who receive three or more grades of "I" or "W" in a semester shall be issued an academic warning.

The purpose of academic warning is to call the interested parties' attention to the student's academic situation and to begin to institute action where necessary. Students receiving academic warning should immediately contact their advisors.

Academic Warning status shall be rescinded if the student's grade point average for the succeeding term is 2.000 or above, or, in the case of grades of "I," when the work has been completed and the grade recorded. Deans may rescind academic warning status if they determine that warning status has been inappropriately applied.

Academic Good Standing
A student is deemed to be in academic good standing if maintaining a cumulative GPA of 2.000 or above after completing 30 credits and if not having received a second consecutive Warning.

Academic Probation
Any student having a cumulative grade point average below 2.000 after the completion of 30 cumulative credits and two semesters at UMass Dartmouth, or who shall have received academic warning in two consecutive semesters, shall be placed in academic probation. Notice of probationary status shall be available to the student's dean, department chairperson, and academic advisor, or, in the case of students who have yet to declare a major, to their advisors of record and to the Academic Advising Center.

The purpose of academic probation is to notify the student of the possibility of his or her dismissal from the university for academic reasons, and of the seriousness of the student's position.

Academic probation has serious consequences. Among them:
•
Probationary status is marked on the student's transcript; and
•
Probationary status precludes a student's participation in extracurricular activities, including intercollegiate athletics. See separate statement below on Academic Eligibility.

Students placed on academic probation may request from the appropriate dean(s) a leave of absence, especially if continued academic activity is likely to lead to a notice of dismissal. Length of the leave and terms of readmission should be determined as a part of the negotiation process for the leave of absence.

Academic Probation status shall cease when the student's cumulative grade point average rises to 2.000 or above or, if the student's probationary status stems from consecutive semesters of academic warning, when the student completes a semester with average grades of 2.000 or above. Deans may rescind academic probation status if they determine that warning status has been inappropriately applied. In such cases notice of probationary status shall be expunged from the student's record.

No student will be placed on probation after only one semester at UMass Dartmouth.

Academic Dismissal
Any student whose cumulative grade point average falls below a satisfactory level in relation to the number of credits completed or who shall have been on academic probation for more than three consecutive terms shall be subject to dismissal by his or her college dean for unsatisfactory academic performance.

Satisfactory levels are as follows:

Cumulative credits	*GPA requirement*
to 30	1.500
31-60	1.700
61-90	1.850
91-above	2.000

"Cumulative credits" include transfer, CLEP, prior learning, exchange, and UMass Dartmouth credits and exclude courses graded W, I, AU, IP, and NR.

Students who withdraw from courses whose cumulative credits exceed 24 are subject to dismissal.

Students who accumulate more than 30 credits in excess of degree requirements within the major are subject to dismissal. Therefore students whose grade point averages are 2.000 or above but whose average grades within the major are below the minimum standards set by that major have a limited time to reach the major's grade point average after their other degree requirements have been met. In each case the student's dean or his or her designee will define "degree requirements" as reflected in the professional certification in addition to meeting the requirements of a traditional major.

Students receiving notice of academic dismissal should discuss their status immediately with their college deans and chairpersons.

No student will be dismissed for academic reasons after only one semester at UMass Dartmouth.

Academic Eligibility
Students who have been placed on academic probation may not serve on university committees, hold leadership positions in student government and other major co-curricular organizations, or represent the university in intercollegiate athletics.

A permanent Academic Eligibility Appeals/Review Committee is established as a subcommittee of the university's Student Faculty Academic Affairs Committee (SFAAC). This committee is composed of two faculty members from that committee (elected by the SFAAC, one elected chair), two students from that committee (elected by the SFAAC as observers, non-voting), the Faculty Athletic Advisor, and the Associate Dean of Students (ex-officio, non-voting). This committee may review requests for waiver of academic eligibility sanctions.

To be eligible for leadership positions in co-curricular organizations, non-Continuing Education students shall be enrolled full time (at least 12 hours) and Continuing Education students shall be enrolled at equivalent full-time levels for their specific programs. Participation in intercollegiate athletics is also governed by enrollment status conditions.

Academic Ethical Standards

Satisfactory Academic Progress for Financial Aid Eligibility

To maintain eligibility for financial aid, students must meet both quantitative and qualitative measures at specific measurement points. The Financial Aid Services office mea-sures incremental progress toward degree completion annually at the end of the acade-mic year in June and will notify students who fail to meet the progress requirements.

Students who fail to meet the requirements will be ineligible for any federal, state, or institutional financial aid until they are once again in compliance. Students who fail to meet the progress requirements may receive federal, state, and institutional financial aid for the next academic year by pursuing one of the following options:

•
By taking summer courses (at their own expense) to raise either the credit hour or grade point average requirement, or both.

•
By requesting a waiver of the requirements due to mitigating circumstances. Mitigating circumstances include, but are not limited to, medical issues, family difficulties, documented waiver, or addition by Dean to program/major requirements. Students wishing to have the requirements waived should write a letter to the Director of Financial Aid detailing reasons for failure to meet the requirements. Students receiving this waiver will be notified of the requirements necessary to bring the hours or grade point average into compliance at the next incremental measurement period.

Quantitative Component
For an undergraduate degree, the maximum credits attempted cannot exceed 150% of the published credits required to complete that program. For example, students could not attempt more than 180 credits in a 120 credit program. At each annual measurement period, students must have completed at least 67% of all courses attempted.

Calculation of credits successfully completed does not include grades of W, I, F, NC, AU, IP, and NR. Transfer students' credits accepted by UMass Dartmouth will be calculated into their quantitative measure of progress. Administrative-credit courses (those that do not count toward degree requirements) are excluded from satisfactory academic progress determination. Repeated courses are included in the measurement of satisfactory academic progress.

All UMass Dartmouth students are expected to maintain high standards of academic integrity and scholarly practice. The University does not tolerate academic dishonesty of any variety, whether as a result of a failure to understand proper academic and scholarly procedure or as an act of intentional dishonesty.

A student found guilty of academic dishonesty is subject to severe disciplinary action which may include expulsion from the University. Refer to the Student Handbook and Student Judicial Code for due process.

A high standard of academic integrity promotes the pursuit of truth and learning and respect for the intellectual accomplishments of others. These are values that are fundamental to the mission of this University. Such values are undermined by academic dishonesty.

Academic dishonesty is defined as attempting to obtain academic credit for work that is not one's own. Examples include: (1) copying another student's answers on an examination; (2) obtaining, or attempting to obtain, the answers to an examination in advance;
(3) submitting a paper that was written by someone else; (4) submitting a paper that includes phrases, sentences and paragraphs that were copied verbatim, or almost verbatim, from a work written by someone else, without making this clear without indicating that these words were someone else's through the use of quotation marks or other appropriate citation conventions;
(5) collaborating on a homework assignment when this has been expressly forbidden by the professor; (6) using unauthorized materials in completing assignments or examinations; (7) submitting the same paper for more than one class without the express permission of the instructors involved. This list of examples should not be considered exhaustive.

This definition of academic dishonesty applies to information submitted in other forms besides paper. Submitting a project of a musical or artistic nature where all or part of the project is someone else's work, without acknowledging this fact, constitutes academic dishonesty. Submitting computer files that do not represent one's own work is also considered to be academic dishonesty; examples of computer-based academic dishonesty would include submitting a computer program or text file created by someone else as one's own, or submitting the output of a computer program written by someone else, and claiming to have written the program that generated the output.

For all forms of academic dishonesty, students who knowingly allow other students to use their work are themselves considered to be academically dishonest. Examples would include students who knowingly allow other students to copy their exam answers, and students who give papers that they have written to other students so that the other students can submit them for credit.

A faculty member is appointed by the Faculty Senate to act as an Academic Ethical Matters Facilitator. This individual will offer advice to both students and faculty about the issues involved in penalizing academic dishonesty, and the process of appealing such penalties.

Penalties assessed by faculty members for academic dishonesty generally consist of a reprimand, a requirement to resubmit the work in a more acceptable form, a lowering of a grade, failure in the course in which the alleged infraction took place, or a combination of these.

Instead of (or in addition to) assessing such penalties, a faculty member may refer the matter to the UMass Dartmouth Student Judiciary. Decisions made by the Student Judiciary may be appealed to the University Appellate Board.

A form acknowledging that each student has read, understands, and will abide by these standards will be signed by the student and placed into the student's permanent file.

Qualitative Component

At each annual measurement period

Students with this number of completed credits:	0-30	31-60	61-90	91-above
Must have at least this minimum cumulative GPA:	1.500	1.700	1.850	2.0

Degree Conferral

Candidates for graduation must declare their intention to graduate formally at the Registrar's Office. The deadlines for that filing are shown in the table. We strongly advise meeting with one's academic advisor during the previous semester to plan the final semester's selection of courses. At about the same time that they declare intention to graduate, students should review their academic records with their departmental advisors for a final time, to ensure that all requirements will have been met properly.

Completion of degree requirements is certified at three different times during the year. Diplomas and transcripts show the date of degree conferral as in the table below.

To give an example, students who completed final required courses in December 2001 had the degree conferred on January 31, 2002, as did students completing a final required course in the January 2002 Intersession. Students completing final required courses in spring 2001 had the degree conferred on June 2, when commencement was held that year. (See below, under "Commencement Exercises," for the policy allowing some students who will not yet have completed requirements to participate in the graduation ceremony.) Students completing requirements in July and August will receive the September 1 completion date.

The spring graduation conferral date is the date of the actual commencement ceremony. Students who complete their final required courses in a term ending by that date will have the June conferral date.

Course grades are recorded for the term in which the student registered for the course. In the case of incompletes, the actual work will be completed after that date. If a student cannot graduate at the end of his or her last term because one or more courses required for graduation have incomplete grades, the student will not receive the diploma or the final transcript until after the incomplete work is made up and the professor has assigned the appropriate new grade. In other words, diplomas and final transcripts are given out after all work required for the degree is completed, but the date on the diploma corresponds to the term in which the final grade is registered.

Graduate students have an exception to this rule for a thesis, project, or dissertation that is not completed by the time that all coursework for the degree is completed. These students register in a special "continuation" status for each term needed to complete their work, and the date of the degree conferral is that for the end of the term in which that work is completed and approved for graduation. See the *Graduate Catalogue* for details.

Once a student graduates, the transcript is closed to subsequent changes (with the exception of correction of errors), to preserve the accuracy of the certification.

Commencement Exercises

The university holds one formal commencement ceremony each year, at the conclusion of the spring semester. Students may participate in the spring commencement exercises once their records are certified. Those whose requirement records are incomplete may also participate under the following conditions:

• Insufficient Credits: Undergraduate students who are no more than twelve credits shy of completion may participate in the spring commencement exercises but will not receive diplomas at the ceremony. Permission to participate in the graduation ceremony will be determined by the student's department. The student must be able to complete work to be eligible for the September 1 diploma.

• Missing Transfer Credits: Students whose records will be completed with the inclusion of credits for one or more courses in transfer from another institution must insure that UMass Dartmouth will have received notification from the other institution by the ending due date for UMass Dartmouth's spring term final grades. Those for whom such notification is received later may participate in the ceremony but will not receive diplomas there. They will receive their diplomas at a later date, and their degree certification will be retroactive to the date of course completion.

We invite students completing requirements in July/August or December/January to participate in the up-coming June graduation ceremony, if they have not already participated in the previous spring. An individual may participate in only one graduation ceremony per degree.

Graduate students should consult the current *Graduate Catalogue* about requirements for participation in commencement.

Completion occurring	*Date on diploma*	*Deadline to declare intention to graduate*
In July/August	September 1	July 1
In December/January	January 31	November 1
By commencement	Day of commencement	March 15

Enrollment as a Non-Degree Student

For assistance:
contact Academic Advisement Center, x8455

Non-Degree or Special Student Registration

Non-Degree or Special Student status allows those not seeking a UMass Dartmouth degree to register for undergraduate classes of the university on a space-available basis. (For graduate non-degree student registration, see the *Graduate Catalogue*.)

The following types of people are welcome to request undergraduate non-degree student status:

•
Students not seeking a degree who wish to take courses for personal and professional reasons. At least a high school diploma or GED must have been received in order for registration to occur. Students must each submit proof of having received a high school diploma or GED, or an associate's or post-baccalaureate degree, before grades are issued at the end of the semester of registration as a special student.

•
Visiting students matriculated at another college. Before registration, an official letter of authorization should be provided from the student's home institution verifying that the student is in good standing. International students seeking a degree and in good standing at another university and holding the F-1 visa from that institution may also request registration as visiting special students at UMass Dartmouth. Visiting students from another UMass campus are invited to use a simplified process to enroll here; see the Admissions chapter of this catalogue.

•
Exchange students studying here by terms of an agreement between UMass Dartmouth and the home institution in another country, pursuing a degree at the home institution. Exchange students receive formal acceptance to the exchange program and are registered in special student status.

•
Persons pursuing one of the certificate programs of the university, listed in the *General Catalogue* chapter on Interdisciplinary and Special Programs. Because certificate students do not receive a formal degree, they are registered as special students. The university's certificate programs offer various opportunities for advisement, program planning, and registration for courses. Participants in certificate programs apply for and formally receive acceptance, and they must meet formally expressed conditions for completion of the program and award of the certificate.

•
High school students. Exceptional high school students may be accepted as part time special students. High school transcripts and letters of recommendation must be provided by the student's high school counselor or principal prior to registration. Such students may study here under the Commonwealth's Dual Enrollment program, described in the chapter on Admissions.

•
Applicants for admission to UMass Dartmouth who were qualified but were denied admission because of space limitations.

The following are not accepted as non-degree students:

•
Applicants who were denied admission to UMass Dartmouth because they did not have the necessary qualifications.

•
Students who have been dismissed by UMass Dartmouth or any other college or university, for at least one semester following the dismissal. Such dismissed students may be recommended by the dean of their college for admission as special students, after a semester away, with conditions for re-admission as regular students specified and with an educational plan designed to assist in the amelioration of past deficiencies. (Others may be recommended to apply for re-admission as regular students after a semester or more away.)

•
International students who would need F-1 visas, except in the case of certain formal certificate programs.

The following procedures and regulations apply to non-degree students:

Students may remain as non-degree students at UMass Dartmouth for a maximum of 30 credits. (The 30-credit limit does not apply to senior citizens.) After completion of 24 credits, the Registrar's Office will inform the student that a maximum is being approached. Any special students who later decide to pursue a degree should seek admission at an early time to guarantee adequacy of academic advisement and progress without an interruption.

Non-degree students whose academic performance falls below the university's general requirements for continuation or who are demonstrably unable to benefit from the educational experience offered may be prohibited from future registration. Such cases are reviewed by the Director of the University Academic Advising Center, whose recommendations are brought for action to the Associate Vice Chancellor for Academic Affairs and Graduate Studies.

All non-degree special students will go to the Academic Advising Center for approval of an application to register for undergraduate courses.

Those seeking graduate enrollment may contact the Office of Graduate Studies for assistance.

Note:
Non-degree special students are not eligible to receive financial aid. An exception to this rule may be made for those admitted to certain official certificate programs.

Major Days of Religious Observance
2002-2003

University policy and Massachusetts state law require faculty to offer make-up assignments or exams to students who are absent for religious observance. As an aid to curriculum planning, the following list of major religious observances is made available by the Office of the Provost. Faculty, staff, and students are advised that the list is not exhaustive of observances of any religion. Please note that Jewish, Baha'i, and some Muslim religious observances begin at sundown of the previous day. Students planning to be absent from classes due to religious observance must notify their instructors at least one week in advance, and otherwise follow the policy stated earlier in this chapter.

Observance/Religion

Fall 2003

Rosh Hashanah
(Jewish New Year)/J
September 27-28 (Sa, S)

Yom Kippur
(Atonement)/J
October 6 (M)

Sukkot
(Festival of Tabernacles)/J
October 11-12 (Sa, S)

Durga Puja
(Worship of Divine Mother)/H
October 13 (M)

Diwali (Festival of Lights)/H
October 25 (Sa)

Ramadan Begins/M
October 26 (S)

Birth of Baha'u'llah/Ba
November 12 (W)

Idul Fitr (End of Ramadan)/M
November 25 (Tu)

Bodhi Day
(Enlightenment)/B
December 8 (M)

Christmas
(Birth of Jesus)/C (legal holiday)
December 25 (T)

Spring 2004

Idul-Adha (Day of Sacrifice)/M
February 7 (T)

Maha Shivaratri (worship of Shiva)/H
February 18 (W)

Muharram (Islamic New Year)/M
March 4 (T)

Holi (Festival of Colors)/H
March 6 (Sa)

Naw-Ruz (Baha'i New Year)/Ba
March 21 (S)

Ramanavami (Birth of Rama)/H
March 30 (Tu)

First Days of Passover/J
April 6-7 (Tu, W)

Hanamatsuri (Birth of Buddha)/B
April 8 (T)

Good Friday
(Crucifixion of Jesus)/C
April 9 (F)

Easter (Resurrection of Jesus)/C
April 11 (S)

Baisakhi (Brotherhood-Sisterhood)/S
April 13 (Tu)

First Day of Ridvan
(Declaration of Baha'u'llah)/Ba
April 21 (W)

Wesak (in celebration of the Buddha)/B
April 27 (Tu)

Summer 2004

Shavuoth (Festival of Weeks)/J
May 26-27 (W, T)

*
B=Buddhist;

Ba=Baha'i;

C=Christian;

H=Hindu;

J=Jewish;

M=Muslim;

S=Sikh

Special Learning Opportunities

Individualized Courses, Alternative Credit, Experiential Learning, Study at Other Institutions

Many students will desire educational experiences that extend beyond the regular courses of the university. The university thus offers various individually-initiated learning experiences to its students.

Such opportunities are of many sorts. They include Independent Study, Contract Learning, and Directed Study; study at a nearby university through cross-registration; study abroad; and receiving credit through a variety of standardized examinations.

Special Course Opportunities

Directed Study

Students who wish to take a regular university course in a term when it is not offered may seek to do so through a Directed Study option. However, students must understand that, because the appropriate faculty must be available and approvals must be granted, the option of Directed Study for a particular course is not always available.

In Directed Study, the faculty member must agree to provide the student with close supervision, in achieving the *same* course objectives that would have been accomplished had the student taken the course on a regular class basis. Permission for Directed Study must be obtained from the subject/course faculty member, the student's department chairperson, and the college dean, after consultation with the faculty advisor.

Forms for enrolling in Directed Study are available at the Registrar's Office. Directed Study courses will be so designated on the student's transcript, displaying the title of the course undertaken. Directed Study courses are offered at each course level, 1xx, 2xx, 3xx, and 4xx, in order to match the level of the course of record.

Independent Study

Independent Study, which is faculty-supervised research or readings into areas of study outside the current curriculum, offers students the opportunity to investigate a research topic or readings independently, under the close supervision of a faculty member. Independent Study will only be approved for research into areas of study that do not duplicate the University's current curriculum of courses.

The student will be responsible for meeting the requirements of the Independent Study as outlined and approved, and the faculty sponsor will assume responsibility for coordinating the Independent Study, evaluating its results, and determining an appropriate grade.

Upper Division students may request to do Independent Study, upon recommendation of a faculty sponsor and approval of the student's department chairperson and college dean. *Twelve semester credits is the maximum of Independent Study allowed for an undergraduate academic career.* The student must submit a written proposal and outline of the program of study to be undertaken, which, if approved by the sponsor and the department chairperson, will become a guide for evaluating the student's performance and accomplishment.

Forms for enrolling in Independent Study are available at the Registrar's Office. Independent Study courses will be so designated on the student's transcript, displaying an annotation of the topic undertaken.

Internships, Practicums, and Experiential Learning

Students in any major may arrange for an external learning experience. Most departments list the course Experiential Learning for their majors; it offers lower-division work experience at an elective level. Some of the university's majors offer upper-division internship or practicum opportunities for students There is considerable variety in the types of experience provided and the levels and amounts of credit.

Experiential Learning

Experiential Learning provides an opportunity for practical application of academic training while earning academic credit.

Under the direction of a faculty sponsor, arrangements are made to work under the immediate supervision of a supervisor at a work site, which may be located on or off campus. The range of project types and settings is almost limitless, creating exciting ways to enrich one's academic studies, to test a tentative career choice, and to gain valuable experience.

The program is administered through the Career Resource Center, where students obtain assistance in finding a faculty sponsor and a work setting and in completing the required forms.

The Experiential Learning contract is an agreement to undertake a significant academic learning experience:

- Participating students maintain a log or journal of experiences. They also receive assessments from the individual they are working for, the supervisor at the work site.
- In all cases, the student must submit a work of writing and reflection to the faculty sponsor. Such a document might, for example, include the following: a) how objectives were met, b) how personal improvement has been stimulated, c) how the internship experience has related to the student's academic experience, and d) how the internship could be improved for students who pursue similar projects in the future. The exact assignment is determined by the sponsoring faculty member.
- The faculty sponsor evaluates the project and assigns either a CR or NC grade.

Students wishing to participate must submit a contract proposal and receive the required approvals. The Career Resource Center

assists students in making these arrangements.

- Students must propose a contract and receive an initial approval *before* the deadline for registration.
- By another deadline, the student must submit a formal written proposal to the faculty sponsor that both specifies the goals and objectives of the internship and details the activities and academic work to be performed.
- By the same deadline, the student must obtain approvals from the faculty sponsor, his/her department chairperson, and her/his college dean.

The following are some of the academic limitations and definitions:

- Students must be at least sophomores to participate.
- Although the typical internship contract would earn three credits, internships proposing a greater/lesser number of credit hours are also possible. Experiential Learning credits are part of the normal student credit load and subject to university policy with regard to credit hour limitations.
- Experiential Learning courses may not be used to fulfill distribution or general education requirements but serve as free electives and may be accepted toward the requirements of some majors.
- Experiential Learning credits are lower-division credits.
- Students on academic probation are not eligible for Experiential Learning, unless ineligibility is waived by their college dean.
- The work assignment is to comprise at least 45 clock hours per academic credit, for the semester.
- Supervision of students doing projects under the Experiential Learning program shall in all cases exclude individuals who are themselves undergraduate degree candidates; and a faculty member cannot serve as both supervisor and sponsor.

Students in the College of Business are offered a junior-level Internship course in lieu of Experiential Learning. They may contact the Career Resource Center for assistance.

General Limitation on Internship Credit

No more than 1/8th of the graduation credits required for the student's major may be earned in optional internships, including Experiential Learning. Thus, a student in a 120 credit program could apply up to 15 credits in such studies toward the degree.

Internships, Clinical Experiences, and Practicums in the Majors

In some of the university's majors, students are required to have an upper-division internship, practicum, or clinical experience; in some others, an optional course is offered. These studies range from an experience nearby in a course the student takes along with other on-campus courses that semester, to a semester or even a year in an extensive experience which may be well away from campus. Consult the requirements section for your major to learn of these opportunities.

Cooperative Education in Engineering

The College of Engineering offers cooperative education experiences to qualified students. Students in the program alternate a semester/summer in coursework with a semester/summer on the job full time. Please consult the front of the catalogue section on the College of Engineering.

Internships Away from Campus through Affiliated Programs

Some programs that may be available to UMass Dartmouth students, like those of The Washington Center or Disney Enterprises, offer a full semester at an internship site. The university has formulated procedures whereby the student can maintain an appropriate enrollment status to participate in such internship programs.

Financial arrangements, enrollment status, and credit that can be earned vary, depending on the program. The Washington Center program provides financial assistance in the form of tuition waivers and some scholarship support, and offers means of earning UMass Dartmouth credit while participating.

Disney internships differ depending whether one undertakes an initial or a second experience, as these vary in how UMass recognizes the academic experience.

More can be learned about these opportunities from advisors in the student's major field or at the Career Resource Center, which serves as the contact point for the many arrangements that the students need to make.

Study Abroad

The university encourages its students to study abroad. A number of exchange agreements have been established to facilitate study abroad, together with procedures for academic advisement, registration, and planning personal finances. In addition, a wide variety of programs are available, both of short duration and for a semester or a year.

Opportunities

The university has formal exchange agreements with the University of Grenoble (France), the Baden-Württemburg Universities (Germany), Centro de Arte e Communiçâcao (Lisbon, Portugal); Nova Scotia College of Art and Design, the Ecole Nationale Superieure des Industries Textiles of the Universite de Haute Alsace (France), and Minho University (Portugal). We are also a member of a consortium of art schools—SACI—in Florence, Italy. Programs at these schools allow students to pursue studies in or related to their UMass Dartmouth major fields.

These exchange agreements also bring students from these many countries to study at UMass Dartmouth.

The exchange programs listed above present only one way for UMass Dartmouth students to study abroad. A large pool of additional exchange opportunities is made available to our students through the Massachusetts Consortium on International Education (MaCIE), which includes all public colleges and universities in the state. Through MaCIE, our students can choose from the study abroad opportunities offered by other public higher education institutions in Massachusetts. In addition, there are informal opportunities for study and travel during the academic year and summer.

For example, in a recent summer, the College of Visual and Performing Arts offered a design, painting, and drawing workshop in La Napoule, France (near the French Riviera). The Overseas Study Program in the College of Business sponsors a yearly trip to another country to explore an area of interest in international business. The Center for Portuguese Studies offers yearly summer study trips to Portugal.

The following people can provide more information about these programs and related opportunities.

General assistance with study abroad—John Carroll, Academic Advising Center

Baden-Württemburg, and its affiliated universities: The Universities of Heidelberg, Mannheim, Freiburg, Ulm, Stuttgart, Konstanz, Tübingen, Hohenheim, and Karlsruhe—Joseph Bronstad, Department of Foreign Literature and Languages; Richard Golen, Assistant Dean, Charlton college of Business

Australia and New Zealand—Kathleen Suchon, Department of Management

Latin America and Spain—John Twomey, Department of Foreign Literature and Languages

United Kingdom—Peter Owens, Department of English

Portugal—Victor Mendes, Department of Portuguese

Centro de Arte—Memory Holloway, Department of Art History; Susan Hamlet, Department of Visual Design

University of Grenoble—Richard Baker, Department of Accounting

France—Lewis Kamm, Department of Foreign Literature and Languages

Ecole Nationale Superieure des Industries Textiles; Minho University (Portugal)—Kenneth Langley, Department of Textile Sciences

Duncan of Jordanstone College, University of Dundee—Michael Taylor, Department of Art History

Summer Programs in Portugal—Michael Baum, Department of Political Science

Summer Programs in Italy and Spain—Benjamin Taggie, Department of History

Policies and Procedures

The Office of the Associate Vice Chancellor for Academic Affairs/Graduate Studies provides general oversight over exchange programs. The Academic Advising Center assists students in making a choice of study abroad site, in making academic plans, and with visa and travel arrangements.

Financial aid may be obtained, if the student is eligible and pursuing the study abroad experience to earn credits toward degree requirements. Students should contact their Financial Aid counselor. Furthermore, a special scholarship, the Mary Louise Walsh Fund for International Study, makes assistance available in the form of grants to undergraduates and graduating seniors.

Students who wish to study abroad while remaining in active student status may be listed as in Study on Exchange status (sometimes called Study Away or Study Abroad). This status allows students to remain in current, registered status while they pursue full-time studies at another higher-education institution, which is usually located in another country. They may thus remain matriculated students and continue to qualify for their financial aid benefits. A modest fee is charged for Study on Exchange status. Forms may be obtained in the Academic Advising Center.

Students seeking to study abroad must first plan with their faculty advisors the program of study that they intend to pursue at the other institution and receive departmental approval of this study plan.

Credits completed while a student is in Study on Exchange status will be displayed on the transcript with grades shown and will be considered for financial aid qualitative requirements. Grades earned in study abroad, converted to UMass Dartmouth equivalents, will be included in calculating the student's GPA and cumulative grade record.

Receiving Credit Through Standardized Examinations

CLEP Examinations
The University has approved the use of the College Level Examination Program (CLEP). The CLEP exams are offered by the College Entrance Examination Board. The program enables those who have reached the college level of education outside the university to demonstrate their achievement and to use the test results for college credit and/or placement.

The equivalency of CLEP examinations to this university's courses shall be determined by the department that teaches that subject matter. CLEP credits may not be used to duplicate or replace credits for coursework taken here or elsewhere. The Office of the University Registrar maintains a current list of CLEP examinations accepted for credit; we advise current students to consult us before deciding to take CLEP tests.

CLEP credits are defined as transfer credits and will not be reflected in an individual's grade point average. *No more than 30 credits earned by CLEP Examination may be used to satisfy degree requirements.*

Two types of CLEP examinations are offered:

Subject Examinations
One semester's course credits (usually 3) or two semesters' course credits (usually 6) may be awarded for a score at or above 50, as reported on the CLEP score report. Such credits are generally used to satisfy university distribution requirements or may be used as elective credits.

General Examinations
Credit is *not* awarded at UMass Dartmouth for the CLEP General Examinations.

Advanced Placement—AP Credit
Advanced placement and/or college credit are awarded to entering freshman students presenting Advanced Placement Examination grades of three or higher (four for credit in Psychology) in most AP fields. AP courses taught in high schools are college-level courses, and the students' mastery of the content is validated by the AP Examination series administered by the College Board. Such course credits may be used to satisfy degree requirements, general education requirements, or will allow students to place into a more advanced initial course.

Advanced Placement—Dual Enrollment Credit
Some freshman students enter the university with college credit already earned, from courses taken at a college or university while they were in high school, many through the Massachusetts Dual Enrollment program.

Military Service Training
For Military Service School training, credit may be awarded according to the recommendations contained in the most recent Guide to the Evaluation of Educational Experience in the Armed Services of the American Council on Education. These credits cannot be applied to the student's major field of studies. Additional information is available at the Office of Admissions.

Credit for Validated Prior Learning
The Division of Continuing Education offers credit for validated prior learning to those who have become regular, registered students. This program provides university academic credit for students in most majors who, through occupational or other experiences, have achieved the equivalent of college-level knowledge. Their prior learning is documented through a one-semester workshop and then evaluated for credit. For further information, consult the Division of Continuing Education.

SACHEM Cross-Registration
UMass Dartmouth students may cross-register for courses at other SACHEM (Southeastern Association for Cooperation in Higher Education in Massachusetts) institutions on a space-available, prior-approval basis. Likewise, students at these other institutions may cross-register for courses at UMass Dartmouth. Institutions involved in the program, in addition to UMass Dartmouth, are:

Bridgewater State College

Bristol Community College

Cape Cod Community College

Dean College

Massachusetts Maritime Academy

Massasoit Community College

Stonehill College

Wheaton College.

Tuition and fees established by the "away" institution are suspended, provided that the matriculated student is a degree-seeking student at the home institution and carries and pays for a full-time load there. Further information and appropriate forms may be obtained in the Registrar's Office.

Outreach: Centers, Laboratories, Programs, and Events

A variety of departments, centers, institutes, and special programs demonstrate UMass Dartmouth's commitment to the well-being of this region and its people. The university plays a singularly important role in the community—a cultural, social, political, and economic resource as well as the predominant center of education and research. The work done in the centers and laboratories expands knowledge and bolsters economic development, while programs and projects inform, inspire, and entertain.

The following are profiles of those arms of the university that extend into the community, and help UMass Dartmouth serve its diverse constituencies. The listing is by no means exhaustive, but presents some key programs and offices that help the institution fulfill its broader purposes.

UMass Dartmouth Foundation
The UMass Dartmouth Foundation develops and directs the university's fund-raising and alumni relations activities. Through the Annual Fund and other campaigns, the Foundation helps secure continuing support for the university and many of its educational, research, and cultural programs.

The Foundation is a tax-exempt corporation with its own charter and board of directors. It solicits, receives, and administers gifts to the university. It also manages UMass Dartmouth's endowment, which includes funds designated for specific purposes, such as scholarships, library programs, faculty development, and the like. The Foundation seeks support for the university in the form of both monetary and non-monetary gifts, and assists with planned gifts and bequests.

Persons who would like to offer support—or who know alumni or others who wish to do so—are encouraged to contact the UMass Dartmouth Foundation at 508 999-8760.

UMass Dartmouth Alumni Association
The Alumni Association provides a variety of activities and services for the university's more than 25,000 alumni living in this country and abroad. The largest volunteer organization on campus, the Association is the liaison between the university and its former students; through it, former students are able to have a voice in determining UMass Dartmouth's future. The association sponsors an annual Homecoming Weekend and numerous other events, and its newsletters keep alumni informed about the school and each other. For further information, call Alumni Association at 508 999-8031, or visit its website, umassd.edu/aa/

Office of Grants and Contracts
The Office of Grants and Contracts helps the university realize one of its key goals: supporting and fostering research, scholarship, and creative productions by faculty and staff. It does so by providing:

- Assistance in identifying funding opportunities; maintaining up-to-date information on sources likely to be most responsive to the university's needs; and lending administrative support for faculty research projects;
- Assistance and guidance in all aspects of development and submission of a proposal;
- Negotiation and administration of contracts for awards, on behalf of the university. (The university's Fiscal Affairs division handles post-award management.)

Today, the university administers more than 12 million dollars in externally funded projects that involve, among other things, research, educational support, and training In the past five years, the level of funding received by the university has more than tripled, the results mean additional support for graduate education, expanded opportunities for faculty research, and a stronger link between the university's goals and the ongoing research activities.

The Office of Grants and Contracts is located in Room 011, Foster Administration Building, 508 999-8942.

Office of Institutional Research
Institutional Research (IR) designs and manages the programs and processes that enable UMass Dartmouth to look at itself and determine if it is fulfilling its mission. The office researches data and produces information and analyses; does strategic planning, with a focus on outcomes assessment; studies specific issues and implements the recommended course of action; conceptualizes and manages data systems; analyzes and recommends on program and policy issues; and advises on planning and management of resources.

The office oversees preparation of the many reports which the UMass system, state and federal governments, and public and private groups require. It works with the academic community on evaluating and implementing actions that aim to enhance students' education and university experience. For further information, call 508 999-8486.

Office of News and Public Information
The News and Public Information Office serves as the link between the university and the media, answering questions and advising of activities, events, and programs. It sends press releases on cultural, education, and social events on campus to newspaper, radio, and television outlets. Feature stories about student achievements are sent to students' hometown newspapers. The office also publishes the campus newspaper, *The Observer*.

The Conferences and Functions Office
helps to coordinate the wide variety of conferences and gatherings that occur at UMass Dartmouth. For information, call 508 999-8143 or 8139.

In September of 2002 a new **Fall River Educational Center** opened in a former department store in the downtown area. This new venture for the Department of Continuing Education offers special educational and professional development programs for non-traditional students. The Cherry & Webb venture reflects the university's continuing collaboration with neighboring communities to expand educational opportunities in the region. The director of the center, Dennis P. Paquette, can be reached at 508 678-3636.

Laboratories, Centers, and Institutes

Centers, institutes, laboratories, and special programs enable the university to realize the goals it has set in a variety of areas.

These special components of UMass Dartmouth play many roles. They:

- encourage and facilitate education that is multidisciplinary and collaborative;
- support and assist faculty from different disciplines in their research work;
- explore and expedite ways to incorporate modern technology into learning;
- develop initiatives and activities to bolster the economy;
- bring cultural and artistic events to both students and the surrounding communities.

Listed here are some of the laboratories, centers, and institutes that demonstrate the university's commitment in the areas of education, research, and public service. Other examples can be found throughout this catalogue.

The **School for Marine Science and Technology (SMAST)**, an academic unit of UMass Dartmouth, is a major center of education, research, and economic development for this campus and the entire UMass system. It spearheads and implements a host of interdisciplinary programs and research ventures in marine science, marine policy, and engineering and technology.

Its director, Dr. Brian Rothschild, joins with the deans of UMass Dartmouth to comprise the academic administration. SMAST is not further divided into departments; it has a program chairperson, and faculty may hold joint appointments in one of UMass Dartmouth's college.

Elsewhere in this catalogue is a description of SMAST's academic program, which constitutes part of the emerging, innovative University of Massachusetts Intercampus Graduate School of Marine Sciences and Technology.

Faculty and staff engage in basic and applied marine science and technology investigations. Continuing research efforts cut across various disciplines: ocean predicting and monitoring systems; coastal zone systems; ocean communications, tracking, and control; fisheries assessment management systems; and aquaculture systems development. An emerging area of research, conducted with the Naval Undersea Warfare Center, involves unmanned underwater vehicles.

SMAST concentrates on the watersheds, embayments, and estuaries along the coastline of Massachusetts and New England, and on the waters of the adjacent U.S. Continental Shelf. This is an important natural laboratory, given its diversity of natural and anthropogenic environmental variability.

SMAST is located on 2.6 acres of land in New Bedford along Clark's Cove, which empties into Buzzards Bay. With 32,000 square feet, the facility features 14 research laboratories, including a freestanding acousto/optic tank. It incorporates a 300 gallon/minute flow-through sea water system which provides ambient Buzzards Bay sea water to all laboratories and a large sea water tank room. It also contains: space to store and maintain marine organisms for use in research and teaching; a radionuclide laboratory; a greenhouse for growth and maintenance of aquatic photosynthetic organisms under natural light; three temperature control rooms for long-term behavioral and physiological experiments and acclimation of marine organisms for culture and reproduction; a 50-foot coastal research vessel, the R/V Lucky Lady; and a dock for temporary mooring and off-loading of research vessels. Support areas include a machine shop, computer room, a conference room with state-of-the-art visual display capabilities and distance learning hardware, and a library/chart room.

The facility's proximity to Buzzards Bay, New Bedford's fishing fleet, and numerous marine-oriented commercial, research, and educational institutions offers unique resources and opportunities, and fosters development of strong links with industry, government agencies, and research and academic institutions. Those interested may contact Dr. Brian Rothschild, director, or Dr. Joseph Deck, deputy director, at 508 999-8925, or visit www.cmast.umassd.edu

The **Northeast Regional Aquaculture Center** (NRAC), located at UMass Dartmouth, serves to support research, development, and education that will enhance viable, profitable aquaculture in this country. The center is one of five such facilities, established by Congress and funded through the U.S. Department of Agriculture's Cooperative State Research, Education, and Extension Service (CSREES). Its major function is funding of projects in the 12 northeastern states.

The center also develops communications and networking links among the many educational, commercial, and state and federal institutions involved in aquaculture; it frequently hosts conferences and workshops. The Executive Director can be reached at 508 999-8157/8536, or visit its website at www.umassd.edu/specialprograms/nrac

As one of only eight members of the **National Textile Center** the university has received grants of $500,000 to $1 million annually over the last four years. With these awards, faculty undertake fundamental research on developing and/or improving the many technologies involved in textiles, apparel, and fibers.

The **Advanced Technology and Manufacturing Center** (ATMC) teams with industries to develop and refine sophisticated technology responses to the current and future needs of the workplace. Through the center, faculty and students are offered significant high technology research opportunities. For students, the center provides a real-world learning experience that makes them particularly appealing to prospective employers. For industry and the southeastern region, the center offers creative yet practical paths toward technological and economic growth.

The ATMC is approximately seven miles from the main campus, on Route 6 in Fall River, near the intersection of Routes 24 and 195.

It has research and incubator facilities for new and emerging firms, as well as conference areas and rental space for

technology companies that wish to be near the university.

Through its "Research and Partnering" component, the center becomes involved in projects and contracts that are funded by industry, government agencies, and other academic institutions. Faculty and students provide the bulk of the technical expertise, with labor supplied by undergraduate and graduate students. The full-time staff provides the coordination and oversight to assure schedule, budget, and contract compliance.

For the students working there, the center replicates the technological business environment of the actual workplace. Qualified students can work in areas such as acoustics, optics, telecommunications, textiles, materials, environmental engineering, manufacturing, transportation systems, and health care technology. Individualized labs feature specialized equipment, and there are core labs for computer software development and mechanical and electrical equipment prototyping.

Incubator areas use an open format to provide flexible facilities for start-up companies, who receive management and marketing advice and administrative support from the university's Commercial Ventures and Intellectual Properties organization.

Conference space features moveable walls so groups of 20 to 200 can meet at any one time. A wide variety of presentation technologies, video and teleconference, and internet access are available.

The Director of the ATMC is Dr. Thomas J. Curry, professor of Electrical and Computer Engineering . For more information, contact the center at 508 999-9116; its website is www.umassd.edu/advtechctr/

The **Family Business Center** offers support and assistance to families who own and operate businesses. The center engages in research, gathers and distributes information, and hosts workshops and seminars. Its programs address a variety of issues, such as teamwork and leadership succession. Contact Donald Berube, director, at 508 999-8773.

The **Omer E. and Laurette M. Boivin Center for French Language and Culture** promotes and supports teaching of, research about, and the appreciation and preservation of the French language and culture. Among its many projects are a certificate program in International Business/ French, a cultural series of speakers and entertainers, and the annual Boivin Center Scholarship. The director is Dr. Mel Yoken, Professor of French, who can be reached at 508 999-8335.

The **Center for Jewish Culture**, through its educational and cultural programs, aims to increase understanding and communication between Jewish and non-Jewish people of Southeastern Massachusetts. The center, which often collaborates with other groups, sponsors workshops, lectures, seminars, and institutes that explore aspects of Jewish culture. It works to expand the Judaica collection in the library, including an archive on the history of Jewish organizations and individuals in the southeastern area. The center also contributes to the support of the campus chapter of Hillel, the international Jewish student organization. The co-directors, Dr. Lewis Dars, professor of economics, 508 999-8050, and Cynthia Yoken, 508-999-6974, may be contacted for information.

The **Arnold M. Dubin Labor Education Center** was established in 1975 to meet the educational needs of workers as members and leaders in the labor movement and promote understanding and cooperation between labor and business, religious, environmental, and other civic and community organizations. The center provides credit and non-credit courses, seminars and special programs, offers support and consultation to the educational programs of labor organizations; provides workers and unions with technical and informational resources; serves as liaison between the university and labor organizations on many levels including worker literacy, training, and economic development activity; and offers a minor and a certificate in Labor Studies and job-related training through the Workers Education Program. Director is José A. Soler, 508 999-8796; coordinator of the Labor Extension is Kim Wilson, 508-999-8781; and co-coordinator of the Workplace Education Project is Lisa Jochim, 508 999-4047.

The **Center for Policy Analysis** is a multidisciplinary research unit which provides research, information, and technical assistance to government, nonprofit, and educational agencies. The Center's guiding mission is betterment of the economic and social well-being of citizens. The Center, striving to remove the walls between education and research, spearheads a number of university and community-based education programs. Students have the chance to work at the center and so become familiar with applied social science techniques. Director is Dr. Clyde W. Barrow who may be reached at 508 999-8943.

The **Center for Portuguese Studies** develops academic programs in Portuguese language, literature, and area studies, as well as interdisciplinary programs and services for the campus and community. It funds research, development, and educational projects, and is building a resource library and archive. The center hosts comprehensive summer institutes, and sponsors a wide range of educational activities and social events to which the public is invited. Support for its work has come from the Portuguese government and state of Massachusetts; the Camões Institute, the Gulbenkian Foundation, and the Luso-American Development Foundation; and local businesses and friends of Portugal and UMass Dartmouth. Director Frank Sousa, professor of Portuguese, can be reached at 508 999-8255.

The **Center for Teaching and Learning** promotes effective teaching both in the kindergarten-Grade 12 schools of the region, and at UMass Dartmouth. The Center builds partnerships among educators in area school districts and university faculty, thus encouraging a collaborative approach for improving curriculum and programs. It links K-12 educators with university faculty on the design and delivery of pre-service and in-service programs for teachers. It also offers a variety of professional development workshops, seminars, graduate courses, and leadership training programs for teachers and administrators. Through "Project Impact," the Center helps schools implement standards-based mathematics and science programs.

To promote effective teaching on campus, the Center provides a program of faculty development that includes seminars, workshops, faculty partnerships, new faculty orientation, colloquia, and access to a library of resources on teaching and learning. The faculty development program seeks to promote active and collaborative learning, effective classroom interactions, classroom-based assessment to inform teaching practice, and effective use of instructional technology. Dr. Marjorie Condon, executive director, can be reached 508 999-9182.

The **Center for Rehabilitation Engineering** helps to improve the quality of life of disabled individuals through creative use of engineering knowledge and technology. The Center develops innovative rehabilitation equipment, techniques, and services, and makes them available to agencies and individuals with disabilities. Volunteers—students, university staff, and community members—are critical to the continuing success of the organization, which has received regional and nationwide acclaim. Director is Engineering Professor Lester Cory, who can be reached at 508 999-8482.

The new **Center for Indic Studies** fosters education about, and understanding of, the arts, philosophy, culture, societal values, and customs of India. The programs and special events promote the study of issues of contemporary Indian society and their place within a multicultural global society. The center also seeks to increase Americans' knowledge of contemporary India and its diversity in the 21st century. Director Bal Ram Singh, chemistry professor, can be reached at 508 999-8588.

The **Gerontology Center** is a multidisciplinary venture, which develops and coordinates programs and courses on gerontology, the study of aging. The center maintains ties with the community through its educational and research-based activities. It has a close relationship with the university's academic offerings, which include a certificate program and a minor in gerontology (described in this catalogue's chapter on interdisciplinary programs). Director Shaleen Barnes can be reached at 508 999-9299.

The **Small Business Development Center**, operated by the Charlton College of Business, serves the businesses of southeastern Massachusetts, Nantucket, and Martha's Vineyard. Funded by the Small Business Administration and the Massachusetts Office of Business Development, it offers free individualized counseling to prospective and existing small businesses on topics such as business plan development, financing, and personnel. There are also inexpensive training programs on a variety of management issues. The center can be reached at 508 673-9783.

The **Robert F. Kennedy Assassination Archive** is an unparalleled, extensive collection of police and FBI reports, audio and video tapes, transcripts, and private papers relating to the assassination of Democratic presidential candidate and New York senator Robert F Kennedy. A project of Political Science Professor Philip H. Melanson with the UMass Dartmouth library, the archive has been recognized nationally and internationally both for its contents and as an important testament to fundamental rights to information. Located in the library, the archive can be reached at 508 999-8686.

The **Slade's Ferry Bank Center for Business Research** is a singular, affordable source of assistance to businesses in the region. Under the auspices of the Charlton College for Business and with financial support from Slade's Ferry Bank, the center offers to businesses research, training, and consulting in the areas of accounting, finance, information systems, management, and marketing. Businesses are able to draw on the university's resources, including the expertise of the Charlton faculty and assistance from students who are guided by their professors. Dr. Nora Ganim Barnes, marketing professor, is director, and can be reached at 508 999-8756, or via e-mail, nbarnes@umassd.edu

UMass Dartmouth Parents' Association
Formed in 1991, the UMass Dartmouth Parents' Association actively participates with university administrators and students to insure communication of ideas, to promote programs that benefit students, parents, and the university, and to act as a parents' support group. Every parent of a current UMass Dartmouth undergraduate student is automatically a member of the organization and is encouraged to offer financial as well as personal support to the activities of the Parents' Association.

Administrative liaison for the Association is provided by the Vice Chancellor for Student Services (contact 508-999-8600 for further information).

The **International Student Leadership Institute (ISLI)** is a program sponsored by the University of Notre Dame and offered annually by UMass Dartmouth to New England high school students. The Institute develops the leadership skills of the participants, and encourages the students to seek opportunities for personal advancement in the service of others. UMass Dartmouth students are group leaders. Persons interested can contact Dr. Victor P. Caliri, psychology professor, at 508 999-8341, or John Fernandes, science and engineering center director, at 508 999-8718.

The **Spotlight Program** is a cultural enrichment program in which area high school students come to the UMass Dartmouth campus for a series of lectures, workshops, courses, and special events during the academic year. This is one of the activities of the UMass Dartmouth Projects for High Learning Potential. Director is English Professor William Nelles, 508 999-8278; for information, contact the Program Assistant, Diane Terrill, at 508 999-8899.

The Arts in Exhibit and Performance

UMass Dartmouth offers the best in arts programming to its students and the community—talented faculty, a variety of groups and ensembles giving performances and mounting exhibits, and superior facilities at both the main campus and the Star Store building in downtown New Bedford make this possible.

Throughout the year, the university sponsors live theater, musical productions, concerts, films, lectures, and fine arts exhibits. The artists and performers might be students, area residents who are launching their careers, or well-known individuals who enjoy international acclaim. As an artistic resource for the entire region, the university enthusiastically encourages the community to attend these events.

Musical Ensembles
Throughout the year, the university sponsors musical offerings of a rich variety, featuring guest artists from around the world from genres of music ranging from classical to New Wave to jazz.

Among on-campus groups that give concerts are: the African Drumming and Dance Ensemble, various jazz ensembles, Concert Band, and the Chorus. Music Department faculty coordinate these concerts, and students from all colleges of the university participate.

Each semester, the College of Visual and Performing Arts sponsors a Guest Artist Series, which features instrumental and voice performances and master classes given by internationally-recognized artists.

Theatre Company
The UMass Dartmouth Theatre Company stages a series of plays throughout the academic year. The productions of musicals, period pieces, and dramatic plays draw large, enthusiastic audiences. Students are joined by university staff and faculty, and frequently members of the community, for both acting and production jobs.

Film Series
An international film series is organized each semester by Dr. Charles White of the English Department. The films come from countries throughout the world, with storylines that are diverse and generally unconventional. Videos of the films become a permanent part of the library collection.

UMass Dartmouth Art Galleries
The university has an arts gallery in its Visual and Performing Arts building and the Crapo Gallery at the Star Store, New Bedford site. Each showcases the works of students and faculty, and throughout the year host exhibits by both emerging and long-established artists who work in a range of mediums. Video presentations and artist lectures often complement the exhibits.

A smaller exhibit space in the Campus Center displays artistic works, often those of students and staff.

Visual Arts Events
Highly-regarded artists are invited to the campus each year. In addition to offering workshops on their mediums and critiques to UMass Dartmouth arts students, the guests often have exhibits and give lectures for the public.

College of Visual and Performing Arts students exhibit and display their work annually. Favorite events include a showing of animation art by electronic imaging students and a spring student outdoor sculpture show.

By taking trips each semester to museums and galleries in Boston, Providence, New York, and Hartford, students broaden their education and see firsthand what is happening on the contemporary art scene.

Summer Events
During the summer, UMass Dartmouth hosts a number of events, notably the Fourth-of-July Celebration that features music, food, and fireworks. The increasingly popular Institute for Art Education sponsors summer seminars and workshops for persons interested in the visual arts.

Key to the Listings of Courses and Programs

Program Requirements

A general statement for each college is followed by separate descriptions of each department in the college and its programs. General requirements that apply to all students in a college are given in the section describing the college. Requirements specific to the programs follow in the sections devoted to each department.

Although the program requirements are presented in full detail, there are many aspects of program planning which will require each student to consult regularly with an academic advisor, and certain decisions require specific permission of the advisor.

Course Descriptions

Following the program descriptions and requirements is a listing of the courses from that department. To learn the selection of courses that is to be offered in any one semester or term, consult the semester *Course Listings* booklet available at the Office of the Registrar.

This catalogue uses a systematic format for course descriptions. *Two examples follow, with explanatory notes:*

	Notes
BIO 314 four credits	*1a, b*
General Ecology	*2*
3 hours lecture, 1 hour laboratory lecture, 3 hours laboratory	*3*
Prerequisites: BIO 121, 122	*4*

General ecology considers the general field of interrelationships between organisms and their environments with emphasis on the biology of populations, and includes laboratory and field studies of terrestrial, fresh water and marine environments. Extended field trips, some of which will be held on weekends and/or holidays, are an integral part of this course. *5*

ARH 150 three credits	*1a, b*
Studies in Visual Culture: Renaissance to Modern Art	*2*
Prerequisite: ARH 125 or permission by instructor	*4*

Surveys painting, sculpture, and architecture from the Renaissance to Impressionism. FOU 125 and 150 need not be taken in sequence. (Formerly ARH 102) *5*

1a
Department Designation and Course Number. Departments use a standard three-letter abbreviation to identify the department or field of the course; the courses shown are for Biology and Art History. The course number then identifies each course uniquely. The 100-level courses are introductory-level; 200, intermediate-level; 300 and 400, advanced and specialized-level; 500 and 600, graduate level. It is generally assumed that students may take the more advanced-level courses only with an appropriate foundation in the field, even if specific prerequisites are not stated.

1b
Number of Credits. Each course carries the number of credits specified. The more credits, the greater the obligation the course carries for in-class and out-of-class work. In courses that use the lecture or lecture-discussion format, there is a one-to-one relationship between the number of credits and the number of class contact hours each week (based on a 50-minute period per hour). See note 3, below.

2
Course Title. Each course is given a unique, descriptive title that indicates its topic and content.

3
Class Type and Contact Hours. Some courses use formats that differ from the lecture or lecture-discussion type. For example, the Biology course here exemplifies a combination of lecture and laboratory experiences. As shown, the number of class contact hours per credit may exceed the number for a class that uses the lecture or lecture-discussion formats only. When there is no annotation, the course uses the lecture or lecture-discussion format. The Art History course exemplifies this. Some course listings have a blanket annotation that applies to an entire sequence of courses.

4
Prerequisites. Stated here are any specific courses (or other requirements) that should have been completed satisfactorily as a condition for taking the course. Prerequisites ensure adequate preparation and maintain an appropriate order in the student's progression through the topics of study in the field. As stated above, even if specific prerequisites are not listed, generally students may take more advanced-level courses only with an appropriate foundation in the field. *Corequisites* are shown for some courses. These are like prerequisites but indicate another course or other experience that is to occur at the same time that the student takes the present course.

5
Course Description. The course description indicates the nature and scope of the course. Often, information is also given about the type of work for the course, as is shown in the Biology example. Course descriptions may close with a special-purpose annotation, as is the case with the Art History course; that annotation indicates a previously-used course number and informs the reader that this new course occupies a parallel role in the curriculum to that of the previous course and that their content is similar. Course descriptions do not indicate the status of a course to fulfill requirements of an academic program. For this information, *Catalogue* users should consult the program requirements listings.

For each course attempted, the course number, course title, and the number of credits are recorded on the student's transcript, together with the grade received.

Courses for General Education

Many different courses satisfy the various requirements of the General Education program. (General Education requirements are summarized in the Academic Regulations and Procedures section of this catalogue.)

Courses identified as Permanently Designated for a General Education requirement are identified in the catalogue's course listings by the following **Key**

C	Cultural and Artistic Literacy
D	Diversity
E	Ethics and Social Responsibility
G	Global Awareness
I	Information and Computer Literacy, Advanced (Tier 2)
M	Mathematics
O	Oral Skills
S	Natural Science and Technology
W	Writing-Intensive Course (Tier 2)

A detailed listing of courses that satisfy these requirements is published separately from the catalogue, in each semester's *Course Listings* booklet.

College of Arts and Sciences

The programs of the College of Arts and Sciences offer students the theoretical and practical foundations for careers in the sciences, humanities, and social sciences, and develop the understanding that enables an informed and independent life.

Majors are offered in Biology, Chemistry, and Medical Laboratory Science (Bachelor of Science); Mathematics, and Multidisciplinary Studies (Bachelor of Arts or Bachelor of Science); and Economics, English, French, History, Humanities/Social Sciences, Philosophy, Political Science, Portuguese, Psychology, Sociology/Anthropology, and Spanish (Bachelor of Arts).

The College also offers minor programs that invite inquiry beyond the bounds of the traditional disciplines. These include: African and African-American Studies, Anthropology, Economics, English (Literature, Writing/communications, and Drama/film Studies), French, German, History, Judaic Studies, Labor Studies, Mathematics, Philosophy, Political Science, Portuguese, Sociology, Spanish, and Women's Studies.

The University does not offer degrees in Pre-Law or Pre-Medical studies, but students intending to enter medical school or law school can plan appropriate programs of study with the help of the Pre-Law or Pre-Medical Advisory Committee. Students interested in teaching careers enroll in the Education Department's program for state certification in addition to their major field of study.

Since many Arts and Sciences students enter the university without yet knowing the specific fields in which they would like to major, the College offers the Liberal Arts pre-major program. This provides students a flexible and well-rounded course of study in the liberal arts and sciences, while also giving them time to discover their individual areas of interest and ability.

Bachelor of Arts Degree

Requirements

All College of Arts and Sciences bachelor of arts candidates must complete the following courses and credits and meet the following requirements.

6 credits
Critical Writing and Reading
ENL 101, 102

6 credits
Literature (except English majors)
Literature in English, literature in a foreign language or foreign literature in translation. Departments of English, Foreign Literature and Languages, and Portuguese shall specify which courses satisfy the requirements.

9 credits
Natural Science
Courses taught in Chemistry, Biology, Medical Laboratory Science, Physics, and selected courses in Nursing and Engineering.

9 credits
Humanities
The credits must not be taken in a student's major field. No more than 6 credits from any one field. Choose from History, Philosophy (including logic), Art History, Music (excluding applied courses), and culture and civilization courses from the departments of Foreign Literature and Languages and Portuguese.

12 credits
Social Science
The credits must not be taken in a student's major field. No more than 6 credits from any one field. Choose from Economics, Political Science, Psychology, and Sociology/ Anthropology.

Department Requirements

Every student must complete at least thirty semester credits of work in the major field. For details see sections under major programs.

A sufficient number of courses must be elected so that the earned credits total a minimum of 120. Certain majors require more than 120 credits.

At least 30 credits must be in courses numbered 300 or higher, exclusive of experiential learning.

Language Requirement

All candidates for the Bachelor of Arts degree (including returning students and transfers from other universities, colleges, or community colleges) must satisfy a language requirement in one of the following ways:
1
Completion of a 202-level course in a language other than English.
2
Satisfactory performance in both oral and written UMass Dartmouth proficiency tests, if a student has fluency in French, German, Italian, Latin, Portuguese, or Spanish. No academic credits are awarded for satisfactory performance on this test. Proficiency tests are administered for all incoming students and transfers on Orientation dates if requested.
3
Satisfactory score on the ETS Achievement Test, the Advanced Placement Test, the Advanced Placement Literature Test, the CLEP Examination, or the TOEFL Examination; the last two, when combined with a writing-sample, an oral examination, and the written permission of the chairperson of the Department of Foreign Literature and Languages.
4
Completion of American Sign Language certification at the intermediate level. Up to six academic credits are awarded for American Sign Language courses provided they are taken at an institution of higher learning such as a Massachusetts community college (in transfer credit); prior approval must be obtained from the Chairperson of the Department of Foreign Literature and Languages.

Exceptions:
1
Students majoring in Sociology/Criminal Justice and taking Spanish as their required language may opt to satisfy the intermediate-level requirement by taking SPA 207 and 208, Spanish for Law Enforcement Personnel I and II, instead of SPA 201 and 202.
2
Learning Disabled Students. Students who are certified by the Disabled Students Office as having difficulties in learning a foreign language may fulfill their requirement by taking two courses taught in English on the history, culture or literature of non-English speaking countries. Courses will be approved by the chair of the Foreign Languages Department, and are in addition to courses used to fulfill the college distribution requirements.
3
Hardship cases. Although there is no provision for waiver of the foreign language requirement, a formal mechanism exists whereby students may seek a reduction of the requirement. The student must initiate the procedure with a written petition to the chairperson of the Foreign Literature and Languages department. The final decision will be made by the dean of the College of Arts & Sciences on an individual basis. If a reduction is granted, the student must fulfill the remainder of the requirements with courses taught in English on the history, culture or literature of non-English speaking countries. Courses will be approved by the chair of the Foreign Languages Department, and are in addition to courses used to fulfill the college distribution requirements.

No credit is awarded to students who have received advanced standing or satisfied the language requirement by passing the appropriate test or by a reduction in the requirement.

Quality Requirement

A cumulative grade point average of at least 2.00 out of a possible 4.00 is required of all students. A grade point average of at least 2.00 is also required in courses in the major field. Individual departments may establish higher quality requirements.

Bachelor of Science Degree

Requirements

All College of Arts and Sciences bachelor of science candidates must complete the following courses and credits and meet the following requirements.

6 credits
Critical Writing and Reading
ENL 101, 102

6 credits
Literature
Literature in English, literature in a foreign language, or foreign literature in translation. The Departments of English, Foreign Literature and Languages, and Portuguese shall specify which courses satisfy this requirement.

18 credits
Humanities/Social Sciences
These credits are to be taken from the areas of Humanities and Social Sciences listed below, with a minimum of six credits from Humanities and six from Social Sciences. The credits may not be taken in a student's major field.

Humanities
History
Philosophy (including Logic)
Art History
Music (excluding applied courses)
Foreign Language (excluding Literature)

Social Sciences
Economics
Political Science
Psychology
Sociology

Department Requirements and Free Electives

Every student must complete at least thirty semester credits of work in the major field. For details see section under major program.

A sufficient number of courses must be elected so that the earned credits total a minimum of 120. Certain majors require more than 120 credits.

At least 30 credits must be in courses numbered 300 or higher, exclusive of experiential learning.

Quality Requirement

A cumulative grade point average of at least 2.00 out of a possible 4.00 is required of all students. A grade point average of at least 2.00 is also required in courses in the major field. Individual departments may establish higher quality requirements.

Biology

The biology major provides opportunities for building the foundation of a career in one of the many specialties in private industry and in federal and state agencies which employ biologists.

Students planning to enter graduate school should, in consultation with their advisor, strongly consider electing a foreign language, analytic geometry, and calculus. For those students interested in pursuing such broad fields of study as ecology, courses which stress computer literacy and database management are good foundation courses. Students looking toward such disciplines as cell and/or molecular biology and developmental biology should take genetics, molecular and cell biology, and biochemistry.

The existing curriculum for biology majors satisfies almost all of the admissions requirements for medical, dental, veterinary, and other graduate health professional programs. Physics laboratories should be added and in many cases calculus is expected. Premedical students should complete their 300-400 level biology electives with courses such as Embryology, General Microbiology, General Genetics, Animal Physiology, Comparative Vertebrate Anatomy, Developmental Biology, Immunology, Molecular Biology, Virology, and Biochemistry. Anatomy and Physiology is very helpful when preparing for the MCAT exam. Ethics for Health Care Professionals serves as an excellent humanities elective. Check with the individual medical school for additional requirements such as psychology and statistics. For more details, seek the advice of the faculty premedical advisory committee members, especially those in the Biology Department.

Modern biology requires a wide range of supporting courses in such other fields of study as statistics, computers, physics, chemistry, electronics, meteorology, and geology. Student biology majors should consult with their advisors early in their program of study as to possible career choices and plan to take appropriate elective supporting courses for their selected field of study.

Faculty and Fields of Interest

Richard C. Connor marine mammal biology

Debra J. Ellis microbial and molecular ecology, soil biogeochemistry, biotechnology

Robert Griffith environmental physiology, vertebrate anatomy and physiology

Peter Hart genetics, cell biology, developmental biology, biotechology

Frederick Y. Kazama microbiology, cell biology, organismal biology

Palma Longo science education

Nancy J. O'Connor invertebrate biology, marine ecology, biology of marine larvae

Kenneth Oliveira fish biology, marine biology

Dorothy Read (chairperson) molecular biology, bacterial genetics, biotechnology

Jefferson Turner biological oceanography, marine plankton, biogeography

Biology Major
BS degree

Students may prepare for admission to medical, dental, and veterinary colleges and for admission to graduate work in the life sciences. Increasing numbers of students elect to major in biology as a means of providing themselves with a general framework of ideas concerning the interactions of living things. A substantial number of these students proceed toward vocational objectives that do not require a specialist's knowledge of biology

Biology Major
Marine Biology Option

The marine biology option is designed to meet the needs of students who aspire to careers in ecology, marine biology, fisheries biology, and biological oceanography. Students who elect the Marine Biology Option are urged to plan their program in close cooperation with their advisors. Biology majors who choose the marine biology option have an opportunity to elect marine-oriented courses during their junior and senior years and must meet college degree requirements for the BS degree.

Requirements

First Two Years
(common to both options)

First Year		Semester Credits First	Second
BIO 121, 131	Biology of Organisms I with Lab	4	
BIO 122, 132	Biology of Organisms II with Lab		4
CHM 151, 152	Principles of Modern Chemistry	3	3
CHM 161, 162	Introduction to Applied Chemistry	1	1
ENL 101, 102	Critical Writing and Reading	3	3
MTH 101, 102*	Elements of College Mathematics	3	3
		14	**14**

* Math course to be selected in consultation with the advisor. MTH 111, 112 (Calculus) is recommended for students whose math background is good, and required for later entrance to graduate programs with a molecular orientation.
It is also a prerequisite for Physical Chemistry. MTH 111, 112 is required for PHY 113, 114 but can be taken concurrently with it.

Second Year			
BIO 210, 211	Biology of Populations with Lab		4
BIO 234, 244	Biology of Cells with Lab	4	
CHM 251, 252	Organic Chemistry	3	3
CHM 263, 264	Bio-organic Chemistry Lab	1	1
PHY 101, 102**	Introduction to Physics	3	3
	Humanities/Social Science Electives	6	6
		17	**17**

** PHY 113, 114 may be substituted for PHY 101, 102.

Third and Fourth Years
(common to both options)

Course selection for the third and fourth years of the biology major must be determined in consultation with an advisor. During the third and fourth year all majors are required to elect at least 18 credits in upper-division biology courses (courses numbered 300 or higher). Upper-division courses in physics, chemistry, engineering, or mathematics may be substituted with the written approval of the advisor and the department chairperson prior to registration in the course. A maximum of 3 credits in biology proseminar may be included in the 18 credits. The requirements of the College of Arts and Sciences must also be met prior to graduation.

Students who have completed the first two years of the biology major may elect to concentrate in courses dealing with the ecology of the coastal zone, its estuaries and inshore waters.

Junior/Senior Electives for Marine Biology Option

Eighteen credits should be elected from upper-division biology courses. At least 12 of these credits must come from the following list of courses.

BIO 317 Biology of Invertebrates
BIO 413 Biology of Fishes
BIO 414 Biology of Marine Mammals
BIO 416 Biology of Algae
BIO 424 Biology of Animal Parasites
BIO 429 Aquaculture
BIO 454 Biology of Sharks
BIO 471 Marine Microbiology
BIO 526 Marine Benthic Ecology
BIO 531 Advanced Ichthyology
BIO 536 Estuarine Ecology
BIO 545 Biological Oceanography
BIO 546 Biology of Marine Larvae

General Education Departmental Requirements

Students majoring in Biology will meet their departmentally-controlled General Education requirements as follows:

Area E: Students may choose a course from the approved list
Area I, Tier 2: Satisfied by BIO 210, 211
Area W, Tier 2: Satisfied by BIO 234
Area O: Students may take any two of the following: BIO 321, 413, 422, 471

Biology Courses

Gen Ed note: Biology courses satisfy the Natural Science and Technology requirement. Those marked S below are appropriate for non-science/engineering majors.

BIO 101 three credits **S**
General Biology I
3 hours lecture
An introductory human biology course emphasizing energy flow and the function of cells and molecules, basic genetics, and selected aspects of human physiology.

BIO 102 three credits **S**
General Biology II
3 hours lecture
Prerequisite: BIO 101 or permission of instructor
Continuation of introductory biology with emphasis on the reproduction and genetics of organisms, their evolution, behavior, and interactions within ecosystems.

BIO 103 three credits **S**
Topics in Biology
3 hours lecture
Prerequisite: BIO 101 or permission of instructor
Study in specific areas of biological science such as human genetics, microbes, and the insect world. Not offered for credit to biology majors.

BIO 105, 106 three credits each **S**
Readings In Modern Biology I, II
Selected books and articles for the general public by scientists and science writers on ideas and research in modern biology. This is a course for non-majors focusing on two or three topics of current interest to biologists: evolution, human evolution, the human brain, genetics and the human genome project interaction of biology and society, and biodiversity. Other topics will be introduced as new books appear. Students will learn how to use the World Wide Web and library in preparing a term project in an area of personal interest.

BIO 111 four credits **S**
Introduction to Human Physiology
4 hours lecture
Introduction to the general physiological principles involved in human body functions with homeostasis as the unifying theme. Not offered for credit to biology majors.

BIO 112 three credits **S**
The Ocean Environment
3 hours lecture
The study of the ocean environment as an integrated ecosystem: The biology of marine organisms and the related physical, chemical, and geological processes of the sea with attention given to the exploitation of marine resources and pollution. Not offered for credit to biology majors.

BIO 113 three credits **S**
The Darwinian Revolution (Honors)
An analysis of the claims, evidence, and methods of Darwinian evolutionary biology based upon an examination of Darwin's *On the Origin of Species* (1st ed., 1859).

BIO 121, 122 three credits each
Biology of Organisms I, II
3 hours lecture
The first course for biology majors is an introduction to structure, function, and behavioral adaptations in the world of living organisms. During the initial half of this two semester course cell origin, structure and chemistry, basic cellular physiology, and genetics are emphasized. The second semester covers the diversity and evolutionary relationships of living organisms, culminating in an in-depth study of a selected ecosystem. Pre-professional aspects are emphasized during both semesters for the biology major student. Field experiences, writing, and problem-solving are integrated into the course work.

BIO 125 three credits **S**
Horticulture
Integrates applied aspects of horticulture (plant propagation, cultivation, landscaping styles, soils, plant materials) with inquiries into the basic structure, reproduction, and other life processes of plants. Work in the greenhouse provides an opportunity to put theoretical questions and topics into practice. Students will develop a sense of the value of plants and gardens in current society; an understanding of horticulture and its relationship to science, technology and arts; and the confidence to work successfully with plants, gardens, and landscapes.

BIO 131, 132 one credit each
Biology of Organisms Laboratory I, II
1 hour laboratory lecture, 2 hours laboratory
The biology of organisms laboratory courses cover two semesters and are designed to provide the student with hands-on experience in investigative techniques and problem-solving. Students work closely with faculty and staff in specialized laboratory investigations in various biological disciplines.

BIO 154 three credits
Fundamentals of Biology
3 hours lecture
Prerequisite: Nursing major
Specifically designed to meet the needs and schedule of the nursing major, covering the breadth of biology in one semester. The ideology and approach of the biological sciences, the chemical and physical foundations of living systems, energy transformations, the origin and diversity of life, Mendelian and molecular genetics, evolution, and population and community ecology

BIO 210 three credits
Biology of Populations
3 hours lecture
Prerequisites: BIO 121, 122, 131, 132
An introduction to the biology of groups of individuals of the same specific kind as units of evolutionary and ecological change: the characterization, origin, and maintenance of phenotypic and genetic variety and the selective and chance processes that shape this variation and effect adaptation, speciation, and the observed geographical and temporal distributions of different kinds of organisms.

BIO 211 one credit
Biology of Populations Laboratory
3 hours laboratory
Corequisite: BIO 210
Experimental approaches to selected topics in population biology are investigated by linking observations on laboratory populations with expectations generated by student-designed computer simulations using BASIC programming. Topics include selection, genetic drift, heritability, and spatial and temporal dispersion patterns.

BIO 216 three credits
Biology of Aging
3 hours lecture
Prerequisite: BIO 101 or equivalent
Presents the biological background to the aging process. This will include a description of the theories of aging and the developmental and physiological changes that occur throughout the aging process. Science elective for Liberal Arts students, free elective for Biology majors. Cross-listed as GRT 216.

BIO 221 three credits
Anatomy and Physiology I
3 hours lecture
Prerequisite: BIO 101
A systematic study of the human body emphasizing structural and functional relationships. Topics include cellular activity and tissue organization. The skeletal, muscular, and cardiovascular morphology and function are presented.

BIO 222 three credits
Anatomy and Physiology II

3 hours lecture
Prerequisite: BIO 221
Continuation of BIO 221. Study of the structure and function of the respiratory, digestive, nervous, urinary, endocrine, and reproductive systems.

BIO 223 one credit
Anatomy and Physiology Laboratory I
1 hour laboratory lecture, 2 hours laboratory
Emphasis is placed on methods of measuring physiological processes. Study of body structure is accomplished by dissection of animal specimens and by use of tissue materials.

BIO 224 one credit
Anatomy and Physiology Laboratory II
1 hour laboratory lecture, 2 hours laboratory
Prerequisite: BIO 223
Continuation of BIO 223.

BIO 234 three credits **W**
Biology of Cells
3 hours lecture, 1 hour recitation
Prerequisites: two semesters Chemistry (concurrent enrollment or credit in Organic Chemistry recommended)
A study of energy transformations, gene expression and regulation, and the function of cells and their organelles. The course emphasizes how function follows structure, particularly at the level of macromolecules.

BIO 244 one credit
Biology of Cells Laboratory
1 hour laboratory lecture, 2 hours laboratory
Corequisite: BIO 234
A laboratory course emphasizing the biochemical, spectroscopic, and microscopic procedures necessary to study cell function.

BIO 251 three credits
Medical Microbiology
3 hours lecture
Prerequisites: BIO 154, CHM 101, 102; open only to students enrolled in the College of Nursing, except by special permission of instructor
Fundamentals of microbiology are presented to prepare students interested in health science field. Topics include basic microbiology, control of microorganisms, host resistance, and pathogenic microorganisms.

BIO 261 one credit
Medical Microbiology Laboratory
Prerequisite: BIO 154, CHM 101, 102
Corequisite: BIO 251
Exercises in microbiological principles and techniques, such as microscopy, staining, growth and quantitation of microbial cultures, and identification of microorganisms by biochemical and other tests. Intended to accompany and illustrate BIO 251 Medical Microbiology.

BIO 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Terms and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

BIO 314 four credits
General Ecology
3 hours lecture, 3 hours laboratory
Prerequisites: Biology core; MTH 101, 102; CHM 151, 152, or permission of instructor
The principles and practices of the scientific discipline of ecology. Interactions among organisms and between organisms and their environment will be emphasized. Interactions will be described and analyzed at the organismal, population, community, and ecosystem levels. In the laboratory, students will use hypothesis-testing and experimentation to examine theoretical and empirical aspects of ecology.

BIO 316 three credits
Descriptive Oceanography
3 hours lecture
Prerequisites: Biology core, or permission of instructor
An introduction to the field of oceanography. Physical, chemical, geological, and biological aspects are emphasized to provide a basic foundation for further work in biological oceanography.

BIO 317 four credits
Biology of Invertebrates
3 hours lecture, 1 hour laboratory lecture, 3 hours laboratory
Prerequisites: BIO 121, 122
This course presents an intensive survey of the taxonomy and functional morphology of the major invertebrate phyla, with special reference to adaptations of the intertidal marine invertebrates of the North Atlantic coast. Field trips to the diverse habitats of the area constitute an integral part of the laboratory.

BIO 318 four credits
General Entomology
3 hours lecture, 1 hour laboratory lecture, 2 hours laboratory
Prerequisites: BIO 121, 122
Introductory survey course in the study of insects. The taxonomy of families will be emphasized in lectures. Studies will also include the structure, habits, physiology, and ecology of insects. During some laboratories, field trips will be conducted.

BIO 320 four credits
Embryology
3 hours lecture, 3 hours laboratory, 1 hour laboratory lecture
Prerequisite: Biology core
A description of reproductive and embryological principles, followed by a study of typical vertebrate and invertebrate embryology. The organogenesis of the major vertebrate systems will be described. The laboratory will include the microscopic study of vertebrate embryos and the observation of the development of selected living vertebrate and invertebrate embryos.

BIO 321 four credits **O**
General Microbiology
3 hours lecture, 1 hour laboratory lecture, 3 hours laboratory
Prerequisite: Biology core
The nature and diversity of microorganisms. Special emphasis is placed on bacterial cytology, nutrition, physiology, and growth. Topics on the significance of microorganisms in the environment and the evolutionary relationships of microorganisms are included.

BIO 322 four credits
Medical Anatomy and Physiology
3 hours lecture, 3 hours laboratory
Prerequisites: Biology core; BIO 221, or permission of instructor
Detailed study of the structure and function of the human body concentrating on the cardiovascular, immune, respiratory, digestive, urinary, and reproductive systems with an emphasis on clinical applications. Lectures coincide with BIO 222 but exams and assignments are separate. Independent laboratory projects allow students to research, design, and execute experiments in anatomy and physiology.

BIO 333 four credits
General Genetics
3 hours lecture, 1 hour laboratory lecture, 3 hours laboratory
Prerequisite: Biology core
Introduction to the science of heredity. The lectures present an integrated concept of the gene provided from the study of Mendelian and molecular genetics. Selected

Gen Ed note: Biology courses satisfy the Natural Science and Technology requirement. Those marked **S** below are appropriate for non-science/engineering majors.

topics in quantitative inheritance, and human genetics are included.

BIO 350 four credits
Survey of Plant Kingdom
3 hours lecture, 1 hour laboratory lecture, 3 hours laboratory and field trips
Prerequisite: One year of Biology of Organisms or equivalent
The phylogenetic relationship among members of the plant kingdom, with an emphasis on evolutionary trends among plant groups rather than on individual plant species. Toward this goal the cytology, anatomy and morphology of monerans through the angio-sperms will be covered. Representatives of most groups will be studied in the laboratory and some will be observed in their natural habitats during two field trips.

BIO 370 four credits
Animal Physiology
3 hours lecture, 1 hour laboratory lecture, 2 hours laboratory
Prerequisites: Biology of Cells (or equivalent); Organic Chemistry
A study of the general principles of animal physiology integrating molecular, cellular, organ system, and whole organism approaches. The accompanying laboratory will provide skill in the techniques used in animal physiological investigations.

BIO 411 one to three credits
Proseminar: Current Topics in Biology
1 to 3 hours
Students with senior standing (or others with consent of the instructor) report on and discuss current biological problems as presented in principle journals, abstracts and reviews. The work of each seminar is usually built upon a single unifying content area.

BIO 413 four credits **O**
Biology of Fishes
3 hours lecture, 1 hour laboratory lecture, 3 hours laboratory
Prerequisites: BIO 121, 122
Field trips and extensive laboratory work are emphasized in this course. The life histories, ecology and classification of the fishes of the coastal and inland waters of the northeastern states are studied in detail.

BIO 414 three credits
Biology of Marine Mammals
Prerequisite: Biology core
Biology of marine mammals, including cetaceans (whales and dolphins), pinnipeds (seals, sea lions, and walruses), sirenians (dugongs and manatees), and sea otters. Fossil, anatomical, physiological, life history, behavioral, and ecological evidence is marshalled to explore marine mammal adaptations for reproduction, feeding, locomotion, diving, thermoregulation, communication, and sensing their environment.

BIO 415 four credits
Comparative Vertebrate Anatomy
3 hours lecture, 1 hour laboratory lecture, 3 hours laboratory
Prerequisite: Biology core
Structure and phylogeny of vertebrates. Laboratory work illustrates evolutionary trends and specializations.

BIO 416 four credits
Biology of Algae
3 hours lecture, 1 hour laboratory/lecture, 3 hours laboratory
Prerequisite: One year of Biology of Organisms or equivalent
The freshwater and marine algae of the northeastern United States, surveyed with an emphasis on their taxonomy, evolution and ecology. The laboratory focuses upon the identification, morphology and ecology of all major algal groups. Extended field trips into Buzzards Bay, Vineyard Sound, and the north shore are an integral part of the course.

BIO 419 four credits
Biological Scanning Electron Microscopy
1 hour lecture, 6 hours laboratory
Prerequisite: Permission of instructor
Theory and techniques of scanning electron microscopy, including optical theory, photographic darkroom techniques, and specimen preparation. Students will be expected to complete a project, the results of which will be presented in written and finished photographic form.

BIO 420 three credits
Animal Behavior
Prerequisite: Biology core
The study of comparative and evolutionary aspects of behavior of invertebrate and vertebrate animals. Structure and function of nervous systems, simple behavioral patterns including reflexes and other forms of innate behavior as well as more complex patterns including learning and social behavior are stressed.

BIO 421 four credits
Developmental Biology
3 hours lecture, 1 hour laboratory lecture, 3 hours laboratory
Prerequisite: Biology core, especially biology of cells
The molecular, cellular and morphogenetic aspects of embryology, organogenesis and other developmental phenomena of animals are considered in the lecture. Some aspects of plant development are discussed. The laboratory includes experiments that demonstrate the morphogenetic activities of the cell. Students are encouraged to design their own experiments.

BIO 422 three credits **O**
Immunology
3 hours lecture
Prerequisites: BIO 234 or equivalent, CHM 251
Molecular and cellular basis of immune phenomena with emphasis on experimental foundations of current models. Differentiation of T and B lymphocytes, cell-cell interactions, antibody structure and function with underlying genetic rearrangements, mechanisms of resistance to disease and immune dysfunction, including AIDS. Understanding of research techniques and research process is promoted.

BIO 424 four credits
Biology of Animal Parasites
3 hours lecture, 1 hour laboratory lecture, 2 hours laboratory
An introductory course in parasitology emphasizing the more important protozoan, helminth, and arthropod parasites of medical, veterinary, and marine significance. Laboratory exercises include practical and experimental techniques.

BIO 427 three credits
Molecular Biology
3 hours lecture
Prerequisites: BIO 234, 244
The methods and research that support models of cell function at the molecular level. This three credit lecture course will present current advanced research methods in molecular biology—those used to study the expression and regulation of genes, and the laboratory research on the macromolecules involved. Students will read and paraphrase current literature in the field of molecular biology.

BIO 428 three credits
Evolutionary Ecology
Prerequisite: BIO 314, 420 or 437
Natural selection theory applied to diverse problems in evolutionary biology including the levels of selection, adaptation and optimality models, kin selection, recognition

systems, cooperation and altruism among non-relatives, co-evolution, mutualism and parasitism, specialization, sex ratio evolution, genetic conflicts, the evolution of sex, sexual selection, parental care, life history evolution, game theory and animal contests, group living and social organization in birds and mammals.

BIO 429 four credits
Aquaculture
3 hours lecture, 3 hours laboratory
Prerequisites: Biology core, BIO 314, BIO 317, BIO 413, or BIO 416, or permission of instructor
The study of aquaculture in a global context with emphasis upon a few selected forms to serve as working models. The course includes a consideration of both theoretical and practical aspects of aquaculture. Whenever possible, the laboratory work will emphasize hands-on experience in laboratory and field aquaculture techniques. A student team approach will initiate, develop and/or maintain an aquaculture project.

BIO 430 four credits
Introduction to Biological Statistics
3 hours lecture, 1 hour laboratory lecture, 2 hours laboratory
Prerequisite: MTH 101, 102 or equivalent, upper division biology standing
Statistical concepts for the planning of experiments and the summarization of numerical data. Lectures emphasize probability, testing of hypothesis and the application of different, statistical concepts and problems.

BIO 435 three credits
Methods and Materials for Secondary School Teachers of Biology
Free elective credit only
This course is designed for future teachers of biology. The course emphasizes modes of inquiry, methods of research and experimentation, and teaching strategies. MAT graduate students take this course as BIO 635.

BIO 437 three credits
Evolutionary Biology
3 hours lecture
Prerequisites: Biology Core
An overview of contemporary evolutionary biology with an emphasis on evolutionary processes. A non-introductory study of the interplay in time and space of genetic variety, ecological opportunity, and chance resulting in the evolutionary change in groups of organisms.

BIO 438 one credit
Evolutionary Biology Laboratory
3 hours laboratory
Prerequisites: Biology Core
Corequisite: BIO 437
Computer models of aspects of evolutionary processes will be designed. The models will selectively address problems in such areas as selection and polygenic inheritance, genetic drift, concerted evolution in multigene families, differentiation of protein-coding nucleotide sequences, molecular clocks, sex, stochastic processes in macroevolution and wild animal conservation genetics. A Biology of Populations-level (BIO 211) knowledge of BASIC programming is expected.

BIO 440 two credits
Research Project
Hours will be arranged.
An advanced research project in an advanced student's field of general interest conducted under the supervision of an appropriate staff member, in the form of independent research leading to the solution of a problem.

BIO 441 two credits
Research Project
Continuation of BIO 440.

BIO 442 three credits
Advanced Genetics
3 hours lecture
Prerequisite: BIO 337 or 333
A historical perspective of the concepts leading to the present theory of gene structure and function. The rigorous experimental evidence supporting this synthesis is reviewed by extensive reading and discussion of original publications. Particular emphasis is placed on papers published since 1940 and having direct bearing in elucidating the structure and function of the gene.

BIO 452 three credits
Virology
Prerequisites: BIO 234, 244 or permission of instructor
Nature of the virus as both an evolutionary entity and an obligatory cellular parasite. The structure and replicative strategies of representative viruses are studied. The approach is molecular and stresses the interaction of the viral genome with cytoplasmic and nuclear elements of the host cell.

BIO 454 three credits
Biology of Sharks
Prerequisite: Permission of instructor
The morphology, physiology, behavior and evolutionary history of the most ancient group of living jawed fishes. The most unusual aspects of these fish, such as modes of reproduction, osmotic regulation, feeding mechanisms, and sensory physiology, will be stressed throughout.

BIO 471 four credits **O**
Marine Microbiology
3 hours lecture, 1 hour laboratory lecture
Taxonomy, physiology, and the role of heterotrophic microorganisms in the marine environment. The viruses will also be considered. Emphasis will be placed on the activities of the viruses, bacteria, and the fungi in the marine environment in the laboratory, exercises will be conducted on the methods of enumeration, detection of selected physiological groups, uptake and deputation of microorganisms by shellfish, marine biodeterioration, and the influence of environmental parameters on the growth and activities of marine microorganisms.

BIO 495 three credits
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Terms and hours to be arranged.

BIO 196, 296, 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Terms and hours to be arranged.

Note: Some graduate courses may be open to undergraduates. Please consult your department chairperson. See the *Graduate Catalogue* for graduate general and program requirements.

Graduate Courses in Biology

BIO 510 four credits
Marine Biotechnology
Designed for persons who wish to participate in research and development within biotechnology. This course features extensive hands-on laboratory work with current techniques and experimental approaches, integrated with an exposition of the principles underlying the techniques.

BIO 511 one to four credits
Graduate Seminar in Biology
1 to 4 hours in varied formats
Selected topics in Biology. In recent years these have included physiology and biochemistry of marine animals, evolutionary ecology, biology of marine mammals, morphometrics and phylogenetic systematics, and extremophiles.

BIO 513 four credits
Biology of Fishes
See BIO 413.

BIO 514 three credits
Biology of Marine Mammals
See Bio 414.

BIO 516 four credits
Biology of Algae
(Formerly BIO 515)
See BIO 416.

BIO 518 three credits
Biogeography
Prerequisite: Senior or graduate standing
The study of present and past global distributions of plant and animal taxa in terrestrial, marine and freshwater habitats. Distributional patterns will be considered in relation to changes of the physical environment over geological time, such as in global patterns of climate and resources. The evolution of recent association of organisms will also be examined in relation to ecological interactions between organisms, such as competition and predation.

BIO 520 three credits
Animal Behavior
See BIO 420

BIO 524 four credits
Biology of Animal Parasites
See BIO 424.

BIO 525 one credit
Graduate Student Seminar
Prerequisite: Graduate status
Each student will present a seminar related to the current semester's theme and based on several contemporary publications. Students are responsible for preparing a comprehensive bibliography, an abstract, and evaluations of peers' seminars. (One semester required; maximum two credits towards MS degree.)

BIO 526 four credits
Marine Benthic Ecology
3 hours lecture, 3 hours laboratory
Prerequisite: Graduate standing or permission of instructor
An advanced overview of the structure and function of marine benthic communities from the intertidal zone to the deep sea, focusing on the power of experimental studies in elucidating ecological processes. Students will improve writing skills via preparation of short research proposals, a term paper, and through peer review of other students' work. Students will also lead discussions of journal articles, and plan, undertake, and present the results of a field biofouling study.

BIO 527 three credits
Molecular Biology
See BIO 427. In addition, graduate students will present two typical reviews of current problems in molecular biology, both as written expositions and as interactive lecture presentations to other class members. Pre- and post-presentation interviews with the instructor are also required.

BIO 528 four credits
Evolutionary Ecology
See BIO 428

BIO 530 four credits
Introduction to Biological Statistics
See Bio 430

BIO 531 four credits
Advanced Ichthyology
3 hours lecture, 3 hours laboratory
Prerequisite: Graduate standing or consent of instructor
Studies of fish phylogeny and classification, physiological problems peculiarly faced by fish, and aspects of fisheries' hydrography. The laboratory stresses independent work on the structure of fish populations, measurement of physiological parameters, and morphometric analysis.

BIO 535 four credits
Analysis of Biological Data
3 hours lecture, 2 1-1/2 hour laboratory meetings
Prerequisite: Introduction to biological statistics or equivalent
The processing and analysis of biological, and especially ecological data. Topics include problems encountered in processing and handling of data, distributions and transformations, associations, computer simulations, parametric and non-parametric methods, and usefulness and limitations of multivariate methods

BIO 536 four credits
Estuarine Ecology
3 hours lecture, 3 hours laboratory
Prerequisite: Graduate standing or permission of instructor
An overview of biological, geological, physical, and chemical factors and processes important for organisms in estuarine environments. Emphasis is on contemporary research areas, including human impacts in estuaries. Students will design, perform, analyze and present the results of semester-long field projects characterizing a local salt-marsh ecosystem.

BIO 537 three credits
Evolutionary Biology
See BIO 437.

BIO 538 one credit
Evolutionary Biology Laboratory
See BIO 438.

BIO 545 four credits
Biological Oceanography
3 hours lecture, 3 hours laboratory
Prerequisite: BIO 316 or permission of the instructor
The cycle of productivity in the marine environment and the physiological and morphological adaptations of plant, animal and bacterial populations within various oceanic regions. Interrelationships of the plankton, the nekton, and the benthos are stressed.

BIO 546 four credits
Biology of Marine Larvae
3 hours lecture, 3 hours laboratory
Prerequisite: Graduate standing or permission of instructor
An analysis of factors important for animals with complex life cycles, focusing on marine benthic invertebrates. Larval stages will be examined from a wide range of perspectives: ecological, evolutionary, oceanography, behavioral, physiological, and developmental. Students will hone verbal skills through presentations on species and topics of interest, and by leading class discussion. The laboratory will examine larval types and aquacultural techniques.

Note: Some undergraduate senior-level courses are offered to graduate students under a corresponding 5xx number, with concurrent enrollment but additional work expectations.

BIO 552 three credits
Virology
See BIO 452.

BIO 554 three credits
Biology of Sharks
See BIO 454

BIO 571 four credits
Marine Microbiology
See BIO 471.

BIO 593 one to three credits
Graduate Research Project
Prerequisite: Graduate standing and consent of instructor
Directed research for graduate students, hours by arrangement. Graded A-F.

BIO 595 three credits
Graduate Independent Study
Prerequisites: Graduate standing; permission of instructor, graduate director, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Terms and hours to be arranged.

BIO 596 three credits
Graduate Directed Study
Prerequisites: Graduate standing; permission of the instructor, graduate director, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Terms and hours to be arranged.

BIO 599 not to exceed ten credits
Graduate Thesis
Prerequisite: Graduate standing and consent of instructor
Terms and hours to be arranged.
Graded A-F.

Graduate Courses in Biology Education for Master of Arts in Teaching

BIO 600 three credits
Teaching Science in the Elementary School
Not for credit in Biology MS program.
Life, physical, and earth sciences that are involved in the development of scientific concepts and processes for elementary school science. A variety of natural phenomena, such as the plant, Brassica rapa, will be used as models to develop an inquiry and standards approach to the learning and teaching of science.

BIO 635 three credits
Methods and Materials for Secondary School Teachers of Biology
Not for credit in Biology MS program.
Modes of inquiry, methods of research and experimentation, and teaching strategies. This course is designed for future teachers of biology. Graduate students enroll concurrently with students in BIO 435 but do additional work.

Chemistry and Biochemistry

Undergraduate chemistry at UMass Dartmouth provides the student with the theoretical and practical expertise necessary for success in a wide variety of careers, consistent with the nature of chemistry as the central science. Chemists pursue a broad spectrum of rewarding professional careers ranging from production supervisors in the chemical or petroleum industries to physicians and patent attorneys. The Department is professionally accredited by the American Chemical Society and provides individualized attention and instruction usually encountered only in a small-college setting. Class sizes, especially at the junior and senior levels, are usually small, affording the student ample opportunities for interaction with the faculty.

Teaching and research facilities of the Department of Chemistry and Biochemistry are equipped with modern instrumentation. Recent acquisitions include a Bruker 300MHz FT-NMR, a Bruker Vector 22 FT-IR Spectrometer, a Fluoromax-2 Fluorescence Spectrometer, a Microcal Microcalorimeter, a Midac M-2000 FT-IR with modified cell for protein analysis, a JASCO J-175 Circular Dicroism Spectrometer, a Finnigan MAT 4500 TSQ GC/MS/MS/DS Mass Spectrometer, a Finnigan MAT Isotope Ratio Mass Spectrometer, a Perkin-Elmer Atomic Absorption Spectrophotometer, an Instrumentation Lab. Flame AA/AE Spectrometer, several high performance liquid chromatographs, several UV-V Visible spectrometers, a Sippican/NRL Optical Fiber-Optic based Biosensor, a Cynosure SLL250 Dye Laser Spectrometer, a Antek Nitrogen Analyzer, spectrofluorometers, Pharmacia Biotech Electrophoresis systems, a Jordan Scientific DNA Sequencer, a Amicon Dialyzer/Protein Concentrator, an BAS 100BW3113300 Electrochemical Work Station, an SLM steady state spectrofluorometer, an ISSKO3 time-resolved spectrofluorometer, Waters HPLC systems with diode array detector, a CSC isothermal titration calorimeter, a Quanta 4000 capillary zone electrophoresis system. These new instruments augment existing equipment, which includes infrared, UV-Visible, atomic absorption NMR and mass spectrometers, a differential scanning calorimeter, a capillary gas chromatography, preparative and analytical gas and liquid chromatographs, ultracentrifuges, a voltametric analyzer, scintillation counter, microtiter plate reader and washer, Parr hydrogenation apparatus, electroanalytical instrumentation and related apparatus for chemical and biochemical research. In addition, an electronics shop and electron microscope facilities are shared with other science departments.

The Department, consistent with university policies, emphasizes computer use. The Department maintains a variety of computers and accessories, including IBM and Macintosh microcomputers, terminals, plotters, and printers. The university maintains two Alpha 2100s (Model 4/275) and an Alpha 2000 (Model 4/200) for library research and instructional use. These Alpha computers provide 64 gigabytes of disk storage, operate on an FDDI network, and are full partners in our campus network.

The Department of Chemistry and Biochemistry at UMass Dartmouth also offers a graduate program leading to the degree of Master of Science in Chemistry.

In conjunction with UMass Lowell, this department offers a joint PhD program. This program combines the outstanding resources of the graduate chemistry programs at Lowell and Dartmouth in a new partnership in excellence. The combined areas of research and professional interest on the two campuses offer a rich range of opportunities for their advanced students.

The Department also participates cooperatively in a doctoral program with the University of Massachusetts Amherst. Cooperative Dartmouth/Amherst Chemistry PhD students are supported by assistantships from UMass Dartmouth and pursue their principal research with UMass Dartmouth faculty while they are matriculated degree students of UMass Amherst.

Chemistry Major
BS degree

Faculty and Fields of Interest

Alan H. Bates inorganic and organometallic chemistry

Donald W. Boerth physical organic chemistry, theoretical chemistry

William L. Dills, Jr. (chairperson) biochemistry of carbohydrates, metabolism and metabolic effects of carbohydrate analogues

James A. Golen physical inorganic chemistry, synthesis and molecular spectroscopy of inorganic compounds

David Z. Goodson physical chemistry, theoretical chemical physics, environmental chemistry

Msolin Guo biochemical processes, drug design

Gerald B. Hammond organic chemistry, organofluorine chemistry, natural products, ethnomedicinal chemistry

Michele I. Mandrioli transition metal chemistry and magnetic resonance, computers in chemical education

Catherine C. Neto organic, agricultural, and food chemistry, isolation and elucidation of bioactive natural products

Vesa Nevalainen organic chemistry, catalytic and enantioselective reactions, synthetic and computational chemistry

Emmanuel C.A. Ojadi chemical physics, laser spectroscopy and photochemistry

Bal-Ram Singh physical biochemistry, structure-function relationships of biological macromolecules

Timothy C. K. Su physical chemistry, ion-molecule reactions, mass spectrometry

Dragic Vukomanovic analytical chemistry, electroanalytical chemistry, mass spectrometry, redox biochemistry

Yuegang Zuo analytical, marine, and environmental chemistry

Faculty Member with Chemistry and Biochemistry Joint Appointment
Primary Department

Mark A. Altabet
School of Marine Sciences and Technology

The programs for chemistry majors are designed to provide a solid foundation in the theoretical knowledge and practical laboratory skills necessary for a variety of professional careers. The programs prepare students for graduate study, medical or professional school, teaching, technical sales, technical writing, and industrial or government employment.

In order to fit the needs of the individual student, the department offers to chemistry majors four different options. The courses prescribed for each of these options and the career opportunities available upon completion of each major are described below.

Requirements for each option are shown on the following pages.

Chemistry Major
Chemistry Option

Requirements

This option prepares students for employment in the chemical industry as chemical technicians, salespersons, purchasing agents, market analysts, production supervisors, etc., or in education as secondary school teachers. In addition, this option prepares students for graduate work in fields of chemistry, both pure, such as organic, inorganic, physical, analytical, or biochemistry, and applied, such as clinical, forensic, polymer, marine, or environmental chemistry. It may also be supplemented by graduate work in law, library science, or business, leading to a career as a research chemist, chemical patent attorney, librarian, science illustrator, technical writer, or chemical industry executive. A number of free electives are included to provide flexibility in the program to suit the student's special interest. An appropriate course sequence is shown.

		Semester Credits	
First Year		**First**	**Second**
CHM 151, 152	Principles of Modern Chemistry	3	3
CHM 165, 166	Introduction to Experimentation	2	2
CHM 172	Intro. to Computer Applications for Chemists		1
MTH 111, 112	Analytical Geometry and Calculus I, II	4	4
ENL 101, 102	Critical Writing and Reading I, II	3	3
	Humanities or Social Science[1]	3	3
		15	**16**
Second Year			
CHM 251, 252	Organic Chemistry I, II	3	3
CHM 265, 266	Organic Chemistry Lab I, II	2	2
CHM 362	Introduction to Biochemistry		3
MTH 211	Analytical Geometry and Calculus III	4	
PHY 113, 114	Classical Physics I, II	4	4
	Humanities, Social Science or Literature	3	
	Free Elective		3
		16	**15**
Third Year			
CHM 305	Modern Methods of Chemical Analysis	3	
CHM 307	Procedures of Chemical Analysis	2	
CHM 315, 316	Physical Chemistry I, II	4	4
CHM 318	Physical Chemistry Measurements I		2
CHM 422	Computer/Math Methods in Physical Science[2]		3
	Humanities, Social Science or Literature	3	3
	Free Electives	3	3
		15	**15**
Fourth Year			
CHM 319	Physical Chemistry Measurements II	2	
CHM 401, 402	Chemistry Seminar	0.5	0.5
CHM 431	Principles of Inorganic Chemistry		3
CHM 433	Inorganic Chemistry Laboratory		1
	Humanities, Social Science or Literature[1]		6
	Advanced Chemistry Electives	6	3
	Free Electives	6	3
		14.5	**16.5**
	Total credits:		**123**

1 The Humanities/Social Sciences requirement of 18 credits must consist of at least 6 credits of Humanities and 6 credits of Social Sciences. Note that there is no foreign language requirement for the BS degree. Literature requirement: 6 credits. Literature must be in the English language.

2 Any of the following combinations of courses fulfill the CHM 422 requirement: MTH 212 (or MTH 204) and PHY 234; MTH 212; or MTH 204 and MTH 221 or 227; MTH 212 (or MTH 204) and EGR 301. Students who fulfill the requirement by taking one of these alternative course combinations may not receive additional credit for CHM 422/522.

Chemistry Electives

CHM 352 Organic Preparations
CHM 411 Biochemistry I
CHM 412 Biochemistry II
CHM 414 Biochemistry Laboratory
CHM 421 Organic Mechanisms
CHM 426 Polymer Synthesis and Characterization
CHM 432 Organic Analysis
CHM 442 Applied Spectroscopy
CHM 491 Introduction to Research I
CHM 492 Introduction to Research II
CHM 510 Advanced Organic Chemistry
CHM 511 Biochemistry I
CHM 512 Biochemistry II
CHM 520 Advanced Inorganic Chemistry
CHM 521 Organic Mechanisms
CHM 523 Thermodynamics
CHM 525 Theoretical Organic Chemistry
CHM 526 Polymer Synthesis and Characterization
CHM 527 Electronic Structure of Atoms and Molecules
CHM 529 Physical Biochemistry
CHM 531 Chemical Kinetics
CHM 533 Statistical Mechanics
CHM 542 Quantum Chemistry
CHM 544 Applied Spectroscopy
CHM 550 Special Topics in Chemistry
CHM 551 Electroanalytical Chemistry
CHM 552 Instrumental Methods of Analysis
CHM 553 Nuclear and Radiochemistry
CHM 554 Molecular Spectra and Structure
CHM 555 Methods of Chemical Separation
CHM 556 Magnetic Resonance Spectroscopy
CHM 560 New Synthetic Methods
CHM 562 Natural Products

Departmental General Education Requirements

Students majoring in Chemistry will meet their departmentally-controlled General Education requirements as follows:

Area E: Students should select a course from the published list of available courses that satisfy this requirement.

Area I, Tier 2: Satisfied by CHM 172 or CHM 422.

Area W, Tier 2: Satisfied by CHM 307, CHM 318, or CHM 412.

Area O: Satisfied by CHM 401/402 and one additional course from: CHM 272, 431, or 412.

Chemistry Major
Biochemistry Option

Requirements

The biochemistry option for the BS degree in chemistry is designed for those students with dual interests in biology and chemistry. A student receiving this degree will be qualified to enter industry as a BS biochemist or, with the selection of several education courses, will be well qualified as a high school science teacher. Students with the biochemistry option will be able to enter graduate school in any of the areas of chemistry, biochemistry, molecular biology, pharmacology, nutrition or other life science programs. The following curriculum conforms to that recommended by the American Society of Biochemistry and Molecular Biology for an undergraduate degree in biochemistry. An appropriate course sequence is shown.

		Semester Credits	
First Year		**First**	**Second**
CHM 151, 152	Principles of Modern Chemistry	3	3
CHM 165, 166	Introduction to Experimentation I, II	2	2
CHM 172	Intro. to Computer Applications for Chemists		1
MTH 111, 112	Analytical Geometry and Calculus I, II	4	4
ENL 101, 102	Critical Writing and Reading I, II	3	3
	Humanities or Social Science[1]	3	3
		15	**16**
Second Year			
CHM 251, 252	Organic Chemistry I, II	3	3
CHM 265, 266	Organic Chemistry Lab I, II	2	2
MTH 211	Analytical Geometry and Calculus III	4	
BIO 234	Biology of Cells[2]	3	
BIO 244	Biology of Cells Lab[2]	1	
PHY 113, 114	Classical Physics I, II	4	4
	Humanities, Social Science or Literature[1]		6
		17	**15**
Third Year			
CHM 315, 316	Physical Chemistry I, II	4	4
CHM 411, 412	Biochemistry I, II	3	3
CHM 414	Biochemistry Laboratory[3]		3
CHM 305	Modern Methods of Chemical Analysis	3	
CHM 307	Procedures of Chemical Analysis	2	
	Free Elective		3
	Humanities, Social Science or Literature[1]	3	3
		15	**16**
Fourth Year			
CHM 529	Physical Biochemistry	3	
CHM 401, 402	Chemistry Seminar	0.5	0.5
	Biology/Chemistry Electives	6	3
	Humanities, Social Science or Literature[1]	3	3
	Free Electives	3	6
		15.5	**12.5**
	Total credits:		**122**

Biology Electives
(2 required)[4]

BIO 321	General Microbiology
BIO 327	Molecular Biology
BIO 333, 334	General Genetics
BIO 411	Proseminar: Current Topics in Biology
BIO 419	Biological Scanning Electron Microscopy
BIO 421	Developmental Biology
BIO 460	Transmission Electron Microscopy

Chemistry Electives
(1 required)

CHM 318	Physical Chemistry Measurements I
CHM 319	Physical Chemistry Measurements II
CHM 421	Organic Mechanisms
CHM 422	Computer/Math Methods in Physical Science
CHM 431, 433	Inorganic Chemistry
CHM 442	Applied Spectroscopy
CHM 552	Instrumental Methods of Analysis
CHM 555	Methods of Chemical Separation

1 The Humanities/Social Sciences requirement of 18 credits must consist of at least 6 credits Humanities and 6 credits of Social Sciences. Note that there is no separate foreign language requirement for the BS degree. It is strongly recommended that the humanities requirement be satisfied by taking at least 1 and preferably 2 years of French or German Literature requirement. 6 credits.

2 Students with weak backgrounds in biology may need to take BIO 121, 122, 131, 132 before attempting subsequent biology courses.

3 Students who do not contemplate doing undergraduate research (CHM 491-492) may postpone CHM 414 until their senior year.

4 Other advanced biology or chemistry courses may be substituted with the prior written permission of the biochemistry advisor.

Chemistry Major
Environmental Chemistry Option

Requirements

The Environmental Chemistry Option is designed for students who are interested in the interface of chemistry and science of the environment. Students completing the Environmental Chemistry Option are well prepared for a variety of post baccalaureate careers. Typical career objectives might include those that entail environmental monitoring and analysis, regulatory monitoring and enforcement, industrial compliance and others. In addition, a student who selects the Environmental Chemistry Option is well prepared for graduate studies in chemistry, environmental science, marine science, environmental chemistry and other areas. The variety of environment-related course electives allows students to select a program of study that fits their interests, while the required chemistry courses ensure that they develop expertise within the fundamental areas of chemistry. An appropriate course sequence is shown.

		Semester Credits	
First Year		**First**	**Second**
CHM 151, 152	Principles of Modern Chemistry I, II	3	3
CHM 165, 166	Introduction to Experimentation I, II	2	2
CHM 172	Intro. to Computer Applications for Chemists		1
MTH 111, 112	Analytical Geometry and Calculus I, II	4	4
ENL 101, 102	Critical Writing and Reading I, II	3	3
	Humanities or Social Science[1]	3	3
		15	**16**
Second Year			
CHM 251, 252	Organic Chemistry I, II	3	3
3CHM 265, 266	Organic Chemistry Lab I, II	2	2
CHM 362	Introduction to Biochemistry		3
MTH 211	Analytical Geometry and Calculus III	4	
BIO 234	Biology of Cells[2]	3	
PHY 113, 114	Classical Physics I, II	4	4
	Humanities, Social Science or Literature		3
		16	**15**
Third Year			
CHM 315, 316	Physical Chemistry I, II	4	4
CHM 355	Aquatic Environmental Chemistry	3	
CHM 356	Atmospheric/Terrestial Environmental Chemistry		3
CHM 318	Physical Chemistry Measurements I		2
CHM 305	Modern Methods of Chemical Analysis	3	
CHM 307	Procedures of Chemical Analysis	2	
	Free Elective		3
	Humanities, Social Science or Literature	3	3
		15	**15**
Fourth Year			
CHM 401, 402	Chemistry Seminar	0.5	0.5
CHM 350	Chemical Oceanography	3	
CHM 431	Principles of Inorganic Chemistry		3
CHM 433	Inorganic Chemistry Laboratory		1
	Environment Related Course Elective	3	3
	Advanced Chemistry Elective[3]	3	3
	Humanities, Social Science or Literature	6	3
	Free Electives		3
		15.5	**16.5**
	Total credits:		**124**

Environment Related Electives

An * indicates that this course will also meet College of Arts and Sciences Humanities/ Social Sciences requirements. Students should note that these courses may meet multiple requirements (College, General Education or Departmental) although a total of 124 credits (minimum) will still be required for graduation

BIO 316	Descriptive Oceanography
ECO 337	Environmental Economics*
PHL 320	Philosophy of Science*
PHY 351	Physics of the Environment I
PHY 352	Physics of the Environment II
PSC 345	Politics of Public Health*
PSC 347	Environmental Law*
PSC 348	Marine Policy and Law*
TES 350	Environmental Science and Industry Compliance
BIO 419	Biological Scanning Electron Microscopy
BIO 471	Marine Microbiology
ECO 472	Coastal Resource Economics*

Advanced Chemistry Electives
Recommended for the Environmental Chemistry Option

CHM 319	Physical Chemistry Measurements II
CHM 411	Biochemistry I
CHM 412	Biochemistry II
CHM 422	Computer/Math Methods in Physical Science
CHM 491, 492	Introduction to Research I, II
CHM 531	Chemical Kinetics
CHM 544	Applied Spectroscopy
CHM 550	Special Topics
CHM 551	Electroanalytical Chemistry
CHM 552	Instrumental Methods of Analysis
CHM 553	Nuclear and Radiochemistry
CHM 555	Methods of Chemical Separation
CHM 562	Natural Products

1 The Humanities/Social Sciences requirement of 18 credits must consist of at least 6 credits of Humanities and 6 credits of Social Sciences. Note that there is no separate foreign language requirement for the BS degree. The College of Arts and Sciences Literature requirement is 6 credits in the English language beyond ENL 101 and 102. Courses taken to meet College requirements may also meet environment related course elective requirements and/or General Education requirements.

2 Students with weak backgrounds in biology may need to take BIO 121, 122, 131, 132 before attempting subsequent biology courses.

3 Students who wish to be certified by the American Chemical Society must include among their advanced chemistry electives CHM 319, CHM 431, CHM 433, CHM 411 and CHM 552.

Chemistry Major
Premedical Option

Requirements

This option offers distinct advantages in efficiency, versatility, and rigor in preparation for students interested in further studies in a medical, dental, optometric, podiatric, osteopathic, or veterinary school. Programs for pre-med students should have the approval of Dr. Alan Bates, co-chairperson of the Pre-medical Advisory Committee. Premedical chemistry majors are certified for graduation by the Chemistry Department, just as are conventional majors.

Separately, premedical advising is offered for students in any major at UMass Dartmouth (see program description elsewhere in this *Catalogue*).

A wide variety of majors is appropriate for those intending to attend medical or veterinary school, with appropriate advising.

		Semester Credits	
First Year		**First**	**Second**
CHM 151, 152	Principles of Modern Chemistry	3	3
CHM 165, 166	Introduction to Experimentation	2	2
CHM 172	Intro. to Computer Applications for Chemists		1
MTH 111, 112	Analytical Geometry and Calculus I, II	4	4
ENL 101, 102	Critical Writing and Reading I, II	3	3
	Humanities, Social Sciences, or Literature[1, 5]	3	3
		15	**16**
Second Year			
CHM 251, 252	Organic Chemistry I, II	3	3
CHM 265, 266	Organic Chemistry Lab I, II	2	2
MTH 211	Analytical Geometry and Calculus III	4	
PHY 113, 114	Classical Physics I, II	4	4
BIO 234	Biology of Cells[1]	3	
BIO 244	Biology of Cells Lab	1	
BIO	Biology Elective[2]		3 or 4
	Humanities, Social Sciences, or Literature		3
		17	**15 or 16**
Third Year			
CHM 305	Modern Methods of Chemical Analysis	3	
CHM 307	Procedures of Chemical Analysis	2	
CHM 315, 316	Physical Chemistry I, II	4	4
CHM 318	Physical Chemistry Measurements I		2
BIO 333	General Genetics	4	
	Science Elective[3]		3 or 4
	Humanities, Social Sciences, or Literature	3	6
		16	**15 or 16**
Fourth Year			
CHM 401, 402	Chemistry Seminar	0.5	0.5
CHM 411	Biochemistry I	3	
CHM 431	Principles of Inorganic Chemistry		3
CHM 433	Inorganic Chemistry Laboratory		1
	Humanities, Social Sciences, or Literature	3	3
	Free Electives[4]	6	6
		12.5	**13.5**
	Total credits:		**123-125**

1 Students with weak backgrounds in biology may need to take Biology of Organisms (BIO 121, 122, 131, 132) before attempting subsequent biology courses. Therefore, these two H/SS courses may need to be moved to another year or to a summer session.

2 Appropriate biology electives are BIO 320 (Embryology) or BIO 370 (Animal Physiology).

3 Appropriate electives would be CHM 422 (Computer and Mathematical Methods in Physical Science), CHM 442 (Applied Spectroscopy), CHM 552 (Instrumental Methods of Analysis), BIO 327 (Molecular Biology) or BIO 421 (Developmental Biology).

4 Appropriate electives would be CHM 412 (Biochemistry II), CHM 431 (Principles of Inorganic Chemistry) or CHM 491-492 (Introduction to Research I, II).

5 The Humanities/Social Sciences requirement of 18 credits must consist of at least 6 credits of Humanities and 6 credits of Social Sciences. Note that there is no separate foreign language requirement for the BS degree. Literature requirement: 6 credits.

Chemistry Major
BS-MS Option

Requirements

This option offers advantages to capable students who are willing to devote their summers to furthering their education. For those going on to graduate work, it provides exposure to graduate courses and research, making the transition from BS to PhD level performance easier. For those going into teaching or industry, it yields a significant financial advantage.

		Semester Credits	
First Year		**First**	**Second**
CHM 151, 152	Principles of Modern Chemistry	3	3
CHM 165, 166	Introduction to Experimentation	2	2
CHM 172	Intro. to Computer Applications for Chemists		1
MTH 111, 112	Analytical Geometry and Calculus I, II	4	4
ENL 101, 102	Critical Writing and Reading I, II	3	3
	Humanities, Social Science or Literature	3	3
		15	**16**
Second Year			
CHM 251, 252	Organic Chemistry I, II	3	3
CHM 265, 266	Organic Chemistry Lab I, II	2	2
CHM 362	Introduction to Biochemistry		3
MTH 211	Analytical Geometry and Calculus III	4	
PHY 113, 114	Physics I, II	4	4
	Humanities, Social Science or Literature	3	3
	Free Elective		3
		16	**18**
Third Year			
CHM 305	Modern Methods of Chemical Analysis	3	
CHM 307	Procedures of Chemical Analysis	2	
CHM 315, 316	Physical Chemistry I, II	4	4
CHM 318	Physical Chemistry Measurements I		2
CHM 422	Computer/Math Methods in Physical Science		3
CHM 402	Chemistry Seminar		0.5
	Humanities, Social Science or Literature	6	3
	Free Electives	3	3
CHM 492	Introduction to Research		3
		18	**18 .5**
Summer 3	Research		
	Free Elective		3
			3
Fourth Year			
CHM 401	Chemistry Seminar	0.5	
CHM 319	Physical Chemistry Measurements II	2	
	Advanced Chemistry Electives	6	6
CHM 431	Principles of Inorganic Chemistry		3
CHM 433	Inorganic Chemistry Laboratory		1
CHM 491	Introduction to Research	3	
	Humanities, Social Science or Literature	3	
	Free Elective	3	
		17.5	**10**
Summer 4	Research		
Fifth Year			
CHM 600	Thesis Research	6	6
CHM	Advanced Chemistry Electives	6	3
		12	**9**
Summer 5	Research and completion of thesis		
		Total credits:	**153**

Policy and Procedures

- Humanities/Social Sciences requirement of 18 credits must consist of at least 6 credits of Humanities and 6 credits of Social Sciences. Literature requirement: 6 credits.
- Should a student desire to lighten his/her course load in years three and four, Humanities/Social Sciences electives could be taken during Summer 2.
- The student should select the BS-MS option no later than the beginning of the fourth semester. Entrance into the program requires approval of the Chemistry Faculty. The student in the program may elect to terminate the program after the seventh semester with the completion of the BS requirements.
- Students who select the BS-MS program are eligible for teaching assistantships after completing the requirements for the BS degree (after the seventh semester) and for summer stipends during the fourth and fifth summers.
- At least 12 credits of the chemistry courses that count toward the MS degree must be at the 500 level.
- This program may be applied to the Biochemistry Option with appropriate modifications.
- Students in the BS-MS program must have and maintain a chemistry GPA of at least 3.00 and an overall GPA of 2.75.

Chemistry and Biochemistry Minors

Requirements

Degree candidates who have a grade point average of at least 2.5 in the 100- and 200-level chemistry courses may request admission to the Chemistry or Biochemistry minors. This request must be approved by the Department Chairperson. A 2.0 grade point average in the courses listed will be required for completion of the minor.

Chemistry Minor

		Credits
CHM 151, 152	Principles of Modern Chemistry I & II	6
CHM 161, 162, 166	Introduction to Applied Chemistry I & II and Introduction to Experimentation II **OR**	4
CHM 165, 166	Introduction to Experimentation I & II	
CHM 251, 252	Organic Chemistry I & II	6
CHM 263, 264	Bio-Organic Chemistry Laboratory I & II **OR**	2-4
CHM 265, 266	Organic Chemistry Laboratory I & II	
CHM 305	Modern Methods of Chemical Analysis	3
CHM 307	Procedures of Chemical Analysis Laboratory	2
CHM 315	Physical Chemistry I **OR**	4
CHM 316	Physical Chemistry II (by permission)	
	Total	**27-29**

Biochemistry Minor

		Credits
CHM 151, 152	Principles of Modern Chemistry I & II	6
CHM 161, 162,166	Introduction to Applied Chemistry I & II and Introduction to Experimentation II **OR**	4
CHM 165, 166	Introduction to Experimentation I & II	
CHM 251, 252	Organic Chemistry I & II	6
CHM 263, 264	Bio-Organic Chemistry Laboratory I & II **OR**	2-4
CHM 265, 266	Organic Chemistry Laboratory I & II	
CHM 305	Modern Methods of Chemical Analysis **OR**	3 or 4
CHM 315	Physical Chemistry I*	
CHM 411, 412	Biochemistry I & II	6
	Total	**27-30**

* CHM 316, Physical Chemistry II, may be substituted for CHM 315, with permission.

Combined Chemistry Major—Business Administration Minor

Requirements

This arrangement of courses is designed for the student who combines an interest in Chemistry with career goals in the business world. It is designed to enable the student to fulfill all requirements for the Chemistry Major and the Business Minor within the standard four-year curriculum. The student must be aware that deviations from the recommended course schedule will ensure that additional time in residence will be required. A comparable track is possible for the Biochemistry Option by substituting the appropriate courses.

		Semester Credits	
First Year		**First**	**Second**
CHM 151, 152	Principles of Modern Chemistry I, II	3	3
CHM 165, 166	Introduction to Experimentation	2	2
CHM 172	Intro. to Computer Applications for Chemists		
MTH 111, 112	Analytical Geometry and Calculus I, II	4	4
ENL 101, 102	Critical Writing and Reading I, II	3	3
ECO 231	Economics I		3
	Humanities, Social Sciences, or Literature Elective	3	
		15	**16**
Second Year			
CHM 251, 252	Organic Chemistry I, II	3	3
CHM 265, 266	Organic Chemistry Lab I, II	2	2
CHM 362	Introduction to Biochemistry		3
MTH 211	Analytical Geometry and Calculus III	4	
PHY 113, 114	Classical Physics I, II	4	4
ACT 211	Principles of Accounting I		3
	Humanities, Social Sciences, or Literature Elective	3	
		16	**15**
Third Year			
CHM 305	Modern Methods of Chemical Analysis	3	
CHM 307	Procedures of Chemical Analysis	2	
CHM 315, 316	Physical Chemistry I, II	4	4
CHM 318	Physical Chemistry Measurements I		2
CHM 422	Computer/Math Methods in Physical Science		3
MKT 211	Principles of Marketing	3	
MGT 311	Organizational Behavior		3
	Humanities, Social Sciences, or Literature Electives	3	3
		15	**15**
Fourth Year			
CHM 319	Physical Chemistry Measurements II	2	
CHM 401, 402	Chemistry Seminar	0.5	0.5
CHM 431	Principles of Inorganic Chemistry		3
CHM 433	Inorganic Chemistry Laboratory		1
	Advanced Chemistry Electives	3	6
	Humanities, Social Sciences, Literature or Business Electives	9	9
		14 .5	**16.5**
	Total credits:		**123**

Business Minor Requirements: ECO 231, ACT 211, MKT 211, and MGT 311 are required courses for the Business Minor. ECO 231 also satisfies one of the College of Arts and Sciences Social Sciences requirements. Three courses (9 credits) from among ACT 212, BIS 315, FIN 312, MGT 312, MGT 365, MGT 346, MGT 347 are required to complete the Business Minor. The University requirements for a minor specify that 9 credits must be at the 300-level or above. Note that BIS 315, FIN 312, and MGT 346 have additional prerequisites.

College of Arts and Sciences Requirements: Humanities/Social Science Requirements: 5 courses (besides ECO 231) which must include 2 humanities and one more social science course. Literature requirements: two courses.

General Education Requirements: Students should carefully plan their programs with their advisor to ensure that their courses selected for the Arts and Sciences requirements will also satisfy the appropriate General Education Requirements.

Gen Ed note: Chemistry courses satisfy the Natural Science and Technology requirement. Those marked **S** below are appropriate for non-science/engineering majors.

Chemistry and Biochemistry Courses

CHM 100 four administrative credits*
Preparation for College Chemistry
2 hours lecture, 1 hour recitation,
2 hours laboratory
Helps students overcome science, mathematics, and reasoning difficulties so that they may be successful in their required general chemistry course. The lecture and the laboratory are integrated to ensure that students have direct hands-on experience with most of the abstract ideas covered in the lecture.

CHM 101 three credits **S**
General Chemistry I
4 hours lecture and recitation
Pre- or Corequisite: MTH 101
An introduction to the fundamental chemical laws and theories covering inorganic and organic chemistry and biochemistry with some descriptive chemistry. For non-science majors, nurses and technologists.

CHM 102 three credits **S**
General Chemistry II
4 hours lecture and recitation
Prerequisite: At least a C- in CHM 101
Continuation of CHM 101.

CHM 130 three credits **S**
Chemistry and the Environment
3 hours lecture
Available to anyone in the university, this course provides substantial treatment, with demonstrations, of the chemistry involved in consumer concerns (food additives, medicines, detergents, etc.), air and water pollution, elementary biochemistry, and the general question of power generation and utilization (fuel cells, solar energy conversion, nuclear energy, etc.). No knowledge of chemistry is assumed, but it is hoped the student will have had high school chemistry or its equivalent.

CHM 131 three credits **S**
Environmental Issues from a Chemical Perspective
3 hours lecture
Examines some of the major environmental problems facing society and the knowledge of chemistry needed to comprehend the problem and evaluate possible solutions. The course is available to anyone in the university. It will cover issues associated with chemical industry such as hazardous waste management and pesticide use as well as the risks and benefits of living in a chemical world.

CHM 132 three credits **S**
Chemistry in Nutrition and Health
3 hours lecture
Nutrition and health issues facing people today and the chemistry needed to understand them. Topics to be discussed include health efforts of toxic substances, the science of proper diet, and some of the biochemistry needed to understand diseases such as cancer and AIDS.

CHM 151 three credits **S**
Principles of Modern Chemistry I
4 hours lecture and recitation
Prerequisites: High school chemistry and algebra; and satisfactory score on departmental placement examination
Corequisite: MTH 131 or 111
Physical and chemical principles pertaining to the structure of chemical species and the nature, extent, and rates of chemical reactions. The details of stoichiometry, energy changes associated with chemical reactions, atomic and molecular structure, chemical bonding, and the phenomenon of chemical periodicity are emphasized and discussed in light of modern scientific theories. For science and engineering majors. Honors sections are offered.

CHM 152 three credits **S**
Principles of Modern Chemistry II
4 hours lecture and recitation
Prerequisite: At least a C- in CHM 151
A continuation of CHM 151. The details of the behavior of solids, liquids, & gases, the types of intermolecular forces, colligative properties, gaseous equilibrium, aqueous equilibrium, thermodynamics, electrochemistry, kinetics, and nuclear chemistry are emphasized and discussed in light of modern scientific theories. For science and engineering majors. Honors sections are offered.

CHM 153 three credits **S**
Principles of Modern Chemistry for Engineers
Combined lecture/laboratory format
Prerequisites: High school chemistry and algebra
Corequisite: MTH 113 or 111
Physical and chemical principles pertaining to the structure of chemical species and the nature, extent and rates of chemical reactions. The details of stoichiometry, energy changes associated with chemical reactions, atomic and molecular structure, chemical bonding, chemical periodicity, and the application to materials are emphasized and explored in an interactive format.

CHM 161 one credit
Introduction to Applied Chemistry I
1 hour lecture, 2 hours laboratory
Prerequisites: High school chemistry (with laboratory) is strongly recommended.
Corequisite: CHM 151
An introduction to chemical laboratory techniques and methods with emphasis on preparation, purification, and identification of compounds, elemental analysis, reaction stoichiometry, chemical ionization, thermochemistry, spectrophotometric techniques, and selective descriptive inorganic chemistry. Most experiments involve the identification of unknowns and statistical analysis of data. The experiments in CHM 161 parallel the topics covered in CHM 151. A written laboratory report summarizing the procedure and results for each experiment is required. For science and engineering majors. Honors sections are offered.

CHM 162 one credit
Introduction to Applied Chemistry II
1 hour lecture, 2 hours laboratory
Prerequisites: At least a C- in CHM 151, 161
Corequisite: CHM 152
A continuation of CHM 161 with emphasis on molecular weight determination techniques, colligative properties, qualitative analysis, acid-base chemistry, properties of buffer solutions, chromatographic techniques, kinetics, solubility constant determination, and electrochemistry. Most experiments involve the identification of unknowns and statistical analysis of data. The experiments in CHM 162 parallel the topics covered in CHM 152. A written laboratory report summarizing the procedure and results for each experiment is required. For science and engineering majors. Honors sections are offered.

CHM 165 two credits
Introduction to Experimentation I
2 hours lecture, 4 hours laboratory
Pre- or Corequisite: CHM 151
Corequisite: MTH 131 or MTH 111
Laboratory for chemistry and textile chemistry majors. An introduction to the basic techniques, methods and theory of chemical experimentation, and the recording, analysis, interpretation and reporting of experimental results, based on qualitative and quantitative chemical procedures. Skills of professional quality, needed to use apparatus for the accurate

* Administrative credits do not count towards the total required for graduation.

measurement of mass, volume, color intensity, etc., will be developed.

CHM 166 two credits
Introduction to Experimentation II
2 hours lecture, 4 hours laboratory
Prerequisite: At least a C- in CHM 165
Pre- or Corequisite: CHM 152
Continuation of CHM 165.

CHM 167 one credit
Introduction to Statistics for the Chemistry Lab
2 hours lecture and recitation
Statistics at an introductory level as applied to experiments in a college freshman level chemistry laboratory. Topics covered include the nature of distributions of data, histograms, basic statistical calculations, the normal distribution, t-distributions, statistical tests appropriate for small samples of data criteria for rejection of data, analysis of data and reporting of result and an introduction to propagation of errors. Credit cannot be received for both CHM 165 and CHM 167.

CHM 172 one credit
Introduction to Computer Applications for Chemists
1 hour lecture, 1 hour recitation
Prerequisites: At least a C- in CHM 151, 165
Corequisites: CHM 152, 166
Approaches to chemistry problem-solving using microcomputers. Spreadsheets and other commonly-available applications will be used to study mathematical concepts related to chemistry, to solve problems on topics from the chemistry majors' lecture and lab courses, and to analyze data obtained in the lab. Students also will be taught to search for chemical information on the World Wide Web.

CHM 251 three credits
Organic Chemistry I
4 hours lecture and recitation
Prerequisite: At least a C- in CHM 152
A survey of the chemistry of carbon compounds and introduction to the basic principles of organic chemistry.

CHM 252 three credits
Organic Chemistry II
4 hours lecture and recitation
Prerequisite: At least a C- in CHM 251
Continuation of CHM 251.

CHM 263 one credit
Bio-organic Chemistry Laboratory I
1 hour lecture, 3 hours laboratory
Prerequisites: At least a C- in CHM 152, 162
Corequisite: CHM 251
The synthesis of organic compounds and an introduction to the organic methods of separation, purification and identification. This course is coordinated with CHM 251 and is designed for biology and medical laboratory science majors.

CHM 264 one credit
Bio-organic Chemistry Laboratory II
1 hour lecture, 3 hours laboratory
Prerequisites At least a C- in CHM 251, 263
Corequisite: CHM 252
Continuation of CHM 263.

CHM 265 two credits
Organic Chemistry Laboratory I
1 hour lecture, 3 hours laboratory
Prerequisites: At least a C- in CHM 152, 166; or CHM 162
The synthesis of organic compounds and an introduction to the organic methods of separation, purification and identification. This course is coordinated with CHM 251 and is designed for chemistry and textile chemistry majors.

CHM 266 two credits
Organic Chemistry Laboratory II
1 hour lecture, 3 hours laboratory
Prerequisites: At least a C- in CHM 251, 265
Corequisite: CHM 252
Continuation of CHM 265.

CHM 272 four credits
Descriptive Inorganic Chemistry
2 hours lecture, 3 hours laboratory
Prerequisites: At least a C- in CHM 152, 166
A survey of the preparations and reactions of selected representative elements and transition metals. For each element the following points are treated: physical and chemical properties of the element; occurrence of the element in nature, its extraction and uses; important compounds and their uses, including industrial processes. An introduction to transition metal complexes. An advanced treatment of ionic equilibria including precipitation and complex-formation reactions.

CHM 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

CHM 305 three credits
Modern Methods of Chemical Analysis
3 hours lecture, 1 hour recitation
Prerequisites: At least a C- in CHM 252, 266, 166; recommended: CHM 272
Introduction to chemical and instrumental analytical techniques. The theory of neutralization reactions in aqueous and nonaqueous systems. Oxidation-reduction and complex formation equilibria. Basic theory of electronic circuitry. Introduction to electrochemical methods. Introduction to chromatographic and spectrophotometric techniques.

CHM 307 two credits
Procedures of Chemical Analysis
1 hour lecture, 4 hours laboratory
Corequisite: CHM 305
Laboratory experimentation designed to develop the techniques and illustrate applications of analytical procedures to the solution of chemical problems.

CHM 315 four credits
Physical Chemistry I
4 hours lecture, 1 hour recitation
Prerequisites: At least a C- in CHM 152, MTH 211, two semesters of college physics
An introduction to the theoretical principles underlying chemical phenomena; applications of thermodynamics to chemical phenomena.

CHM 316 four credits
Physical Chemistry II
4 hours lecture, 1 hour recitation
Prerequisite: At least a C- in CHM 315
An introduction to quantum mechanics, symmetry, spectroscopy, chemical kinetics and transport processes.

CHM 318 two credits
Physical Chemical Measurements I
1 hour lecture, 4 hours laboratory
Prerequisites: At least a C- in CHM 305, 307, 315
Corequisite: CHM 316
Experiments in physical chemistry designed to test established theoretical principles which have been introduced in CHM 315 and 316. The experiments provide the student with basic experience in obtaining precise physical measurements of chemical interest.

CHM 319 two credits
Physical Chemical Measurements II
1 hour lecture, 4 hours laboratory
Prerequisites: At least a C- in CHM 305, 307, 316
Continuation of CHM 318.

Gen Ed note: Chemistry courses satisfy the Natural Science and Technology requirement. Those marked **S** below are appropriate for non-science/engineering majors.

CHM 350 three credits **S**
Chemical Oceanography
Prerequisites: At least a C- in CHM 151, 152
Chemical oceanography, with an overview of the interaction between marine chemistry and oceanic physics, biology, and geology. The fundamental processes controlling the distribution of chemical species in the ocean will be explored and implications for global environmental change highlighted.

CHM 352 three credits
Organic Preparations
1 hour lecture, 4 hours laboratory
Prerequisites: At least a C- in CHM 252, 266
A study of the more intricate synthetic procedures of organic chemistry including use of the literature for choice of optimum methods.

CHM 355 three credits
Aquatic Environmental Chemistry
Prerequisites: At least a C- in CHM 151, 152 or permission of instructor
Fundamentals of aquatic environmental chemistry. Topics include dissolved gases chelation, complexation, role of humic substances in the aquatic environment, oxidation-reduction phenomena, chemical speciation, phase equilibria and chemistry related to water pollution issues.

CHM 356 three credits
Atmospheric/Terrestrial Environmental Chemistry
Prerequisite: At least a C- in CHM 355
Fundamentals of atmospheric and terrestrial environmental chemistry. Topics include physical and chemical characteristics of the atmosphere, reactions involving oxygen, nitrogen, carbon dioxide, water and particulates in the atmosphere, gaseous organic and inorganic pollutants. Additional topics include fundamentals of soil chemistry, organic and inorganic soil contaminants and environmental biochemistry and toxicology.

CHM 362 three credits
Introduction to Biochemistry
3 hours lecture
Prerequisite: At least a C- in CHM 251
An introduction to the chemical properties of compounds of biological interest; bioenergetics and enzymology. A survey of the metabolism of proteins, carbohydrates, lipids, nucleic acids and other bio-substances.

CHM 370 three credits
Introduction to Chemical Engineering
3 hours lecture
Prerequisites: At least a C- in CHM 152, 315, or EGR 232
An introduction to the principles of chemical processes, with a special emphasis on material and energy balances. Departmental elective for majors in chemistry and mechanical engineering.

CHM 401 one-half credit
Chemistry Seminar I
1 hour lecture
Lectures on current topics in chemistry from guest lecturers and students. Majors must enroll for two semesters out of four in the junior and senior years.

CHM 402 one-half credit
Chemistry Seminar II
1 hour lecture
Continuation of CHM 401.

CHM 411 three credits
Biochemistry I
3 hours lecture
Prerequisite: At least a C- in CHM 252, recommended BIO 234
Students may not receive credit for both CHM 362 and CHM 411, 412
See description under CHM 511.

CHM 412 three credits
Biochemistry II
Prerequisite: At least a C- in CHM 411
See description under CHM 512.

CHM 414 three credits
Biochemistry Laboratory
1 hour lecture, 6 hours laboratory
Prerequisite: At least a C- in CHM 264 or 266; CHM 411
Pre- or Corequisite: CHM 412
Recommended: CHM 305, 307; BIO 234, 244
Basic biochemical techniques and methods including spectrophotometry, electrophoresis, chromatography, ultracentrifugation and radioisotopic techniques and their application to amino acids and proteins, lipids and membranes, enzymes and nucleic acids.

CHM 421 three credits
Organic Mechanisms
Pre- or Corequisite: At least a C- in CHM 315
See description under CHM 521.

CHM 422 three credits
Computer and Mathematical Methods in Physical Science
Prerequisite: At least a C- in CHM 172, 315; two semesters of college physics, three semesters of calculus; or permission of instructor
Recommended corequisite: CHM 316
See description under CHM 522.

CHM 426 three credits
Polymer Synthesis and Characterization
2 hours lecture, 4 hours laboratory
Prerequisites: At least a C- in CHM 252, 315; recommended, TEC 410
See description under CHM 526.

CHM 431 three credits
Principles of Inorganic Chemistry
Prerequisite: One year of physical chemistry with grades of C- or better
The application of physico-chemical principles to inorganic systems. Discussion of chemistry of the representative elements utilizing thermodynamic principles and the modern theories of bonding and structure. Introduction to coordination chemistry.

CHM 432 four credits
Organic Analysis
Prerequisites: Organic and analytical chemistry with grades of C- or better
Quantitative elemental and group determination on a microscale followed by a study of the systematic identification of organic compounds. Extensive laboratory work on unknowns is required.

CHM 433 one credit
Inorganic Chemistry Laboratory
Prerequisite: At least a C- in CHM 316; corequisite: CHM 431
Synthetic and instrumental techniques currently used by inorganic chemists, including electrolytic, inert atmosphere, tube furnace and organometallic syntheses; ultraviolet-visible, nuclear magnetic resonance, infrared and mass spectrometry, magnetic susceptibility determination, as applied to a range of inorganic materials.

CHM 442 three credits
Applied Spectroscopy
3 hours lecture
Prerequisites: At least a C- in CHM 252, 266, 315
See description under CHM 544.

CHM 449 three credits
Theory and Applications of One- and Two-Dimensional Fourier Transform Nuclear Magnetic Resonance
Prerequisites: At least a C- in CHM 251/252 and CHM 315
See description under CHM 549.

CHM 491 three to six credits
Introduction to Research I

Note: Some graduate courses may be open to undergraduates. Please consult your department chairperson. See the Graduate Catalogue for graduate general and program requirements.

9 to 18 hours laboratory
Prerequisite: Departmental permission
Chemistry majors who are doing well in formal course work and who have indicated research potential are encouraged to undertake an original investigation under the direction of a member of the chemistry faculty.

CHM 492 three to six credits
Introduction to Research II
9 to 18 hours laboratory
Continuation of CHM 491.

CHM 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Terms and hours to be arranged.

CHM 196, 296, 396, 496 variable credit
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Terms and hours to be arranged.

Graduate Courses in Chemistry and Biochemistry

CHM 510 three credits
Advanced Organic Chemistry
Prerequisites: One year of physical chemistry and CHM 521 with grades of C- or better
A study of mechanisms and stereo-chemical aspects of chemical reactions including considerations of chemical kinetics and reactivity in terms of modern bonding theory and structural concepts.

CHM 511 three credits
Biochemistry I
Prerequisite: One year of organic chemistry with grades of C- or better; recommended, cell biology or equivalent
A comprehensive study of biochemistry including amino acid and protein chemistry, enzymology, enzyme kinetics, bioenergetics, metabolism of carbohydrates, lipids, amino acids, nucleotides; biosynthesis of nucleic acids and proteins.

CHM 512 three credits
Biochemistry II
Prerequisite: At least a C- in CHM 511
A continuation of CHM 511.

CHM 514 three credits
Biochemistry Laboratory
1 hour lecture, 6 hours laboratory
Basic biochemical techniques and methods including spectrophotometry, electrophoresis, chromatography, ultracentrifugation and radioisotopic techniques and their application to amino acids and proteins, lipids and membranes, enzymes and nucleic acids.

CHM 520 three credits
Advanced Inorganic Chemistry
Prerequisites: At least a C- in CHM 316 and CHM 431
Selected topics in modern inorganic chemistry.

CHM 521 three credits
Organic Mechanisms
Prerequisite: CHM 252. Prerequisite or Corequisite: One semester of physical chemistry
The first part of the course provides a background in the various areas of physical organic chemistry such as thermodynamics, kinetics, acid-base theory, structure-reactivity relationships and dipole moments. This is followed by a systematic study of reaction mechanisms.

CHM 522 three credits
Computer and Mathematical Methods in Physical Science
Prerequisites: One semester physical chemistry; two semesters of college physics, three semesters of calculus, or permission of instructor. Recommended Pre- or Corequisite: CHM 316, or equivalent
Selected topics in applied mathematics and computer science with applications to physical chemistry, organic chemistry, and bioinformatics. Includes introduction to differential equations, linear algebra, computer programming, curve and surface fitting, numerical integration, trajectory calculations, molecular modeling, quantum chemistry, computational molecular biology, and biological data analysis.

CHM 523 three credits
Chemistry of the Mind
Prerequisite: CHM 315, or equivalent
Exploration of the states of matter as understood by mind by considering reductionist and holistic approaches. Fundamental assumptions in developing scientific principles are examined with examples of kinetic theory of gases, ideal gas equation, and laws of thermodynamics. Application of thermodynamic laws to biological systems to model mind and brain activities. Structure, evolution, and functioning of the nervous system and neurological and metaphysical understanding of mind and consciousness are examined.

CHM 525 three credits
Theoretical Organic Chemistry
Prerequisites or Corequisites: One year each of organic and physical chemistry
Molecular orbital theory of organic molecules; applications of molecular orbital theory; reactivity, ESR, Carbon-13 NMR, photoelectron spectroscopy, etc.; orbital symmetry in electrocyclic reactions, cycloadditions, and sigmatropic reactions.

CHM 526 four credits
Polymer Synthesis and Characterization
Prerequisites. At least a C- in CHM 252, CHM 315; recommended, TEC 410
Laboratory synthesis of polymers and copolymers by different methods with an emphasis on the practical aspects of polymer synthesis. A discussion of various techniques of polymer characterization in terms of basic principles, experimental procedure, and interpretation of results. A selected number of experiments will be conducted on a class-project basis.

CHM 527 three credits
Electronic Structure of Atoms and Molecules
Prerequisite: One year of physical chemistry with grades of C- or better
Fundamental quantum mechanical principles of electronic structure. Angular momentum, the hydrogen atom problem, helium ground and excited states, electron spin and antisymmetrization, many electron atoms, bonding theory, valence bond and molecular orbital theory of diatomic and polyatomic molecules, applications of group theory to molecular orbital calculations, the self-consistent field method.

CHM 529 three credits
Physical Biochemistry
Prerequisite: One year each of physical chemistry and biochemistry with grades of C- or better
Physico-chemical principles governing structures of biological macromolecules. Topics include energetics and kinetics of biochemical processes, including binding, catalysis, diffusion/transport, and folding/unfolding; behavior of macromolecules in aqueous medium; and application of spectroscopic methods in biochemistry.

CHM 531 three credits
Chemical Kinetics
Prerequisite: One year of physical chemistry with grades of C- or better
Principles and selected topics, including analysis of reaction rates, kinetic and transition state theories, reactions in gas and liquid phases, unimolecular reactions, fast reactions, trajectory calculations, ion-molecule reactions, enzyme kinetics, and polymer kinetics.

CHM 533 three credits
Statistical Methods
Prerequisite: One year of physical chemistry with grades of C- or better
Introduction to the principles and methods of statistical mechanics. Classical and quantum partition functions applied to the calculation of thermodynamic properties.

CHM 542 three credits
Quantum Chemistry
Prerequisite: One year of physical chemistry with grades of C- or better
Fundamental concepts of quantum mechanics; wave properties, Schrodinger equation, and operators. Basic application to free particles, harmonic oscillator, hydrogen atom. Perturbation theory and variation method. Applications to many-electron systems and time-dependent problems.

CHM 544 three credits
Applied Spectroscopy
Prerequisites: One year each of organic and physical chemistry with grades of C- or better
A study of spectroscopic methods of determination of structure of organic compounds, especially infrared, ultraviolet, visible, nuclear magnetic resonance, and mass spectrometry, with extensive applications to individual cases.

CHM 549 three credits
Theory and Applications of One- and Two-Dimensional FT-NMR
Prerequisites: At least a C- in CHM 251/252 and 315, or equivalent
Fundamentals of Fourier Transform Nuclear Magnetic Resonance (FT-NMR) spectroscopy, including one- and two-dimensional techniques discussed from the perspective of structural determination. Generation of NMR signals and parameter optimization using a 300 MHz FT-NMR spectrometer will complement the analysis of NMR signals generated in situ.

CHM 550 three credits
Special Topics in Chemistry
Prerequisite: Permission of instructor
An advanced treatment of special topics in chemistry with an emphasis on recent developments. The subject matter varies from year to year.

CHM 551 four credits
Electroanalytical Chemistry
Prerequisite: One year of physical chemistry with grades of C- or better
The development of the fundamental mathematical relationships upon which electrochemical methods are based. The interpretation of the kinetics of electrode reactions and the transfer of material to and from electrodes under various conditions. The interpretation of data of direct analytical significance generated by the methods and techniques of modern electrochemistry.

CHM 552 four credits
Instrumental Methods of Analysis
Prerequisites: Quantitative analysis and one year of physical chemistry with grades of C- or better
The theory and practice of modern analysis utilizing optical and electrochemical instrumentation in the solution of chemical problems. Topics discussed include ultraviolet, visible, and infrared spectrophotometry, fluorimetry, flame emission and atomic absorption spectroscopy, plasma emission spectroscopy, potentiometry utilizing ion specific electrodes, radiochemistry, thermoanalytical methods, voltammetry including polarography, amperometry, and coulometry; liquid chromatography, electron spectroscopy, x-ray fluorescence analysis, and neutron activation analysis.

CHM 553 three credits
Nuclear and Radiochemistry
Prerequisite: One year of physical chemistry with grades of C- or better
Application of nuclear and radiochemical methods. Topics include fundamentals of radioactive decay, radiation safety, interaction of radiation with matter, instrument design and function, radiotracers, radioanalytical methods, and related non-destructive methods for quantitative analysis.

CHM 554 three credits
Group Theory and Spectroscopy
Prerequisite: One year of physical chemistry with grades of C- or better, CHM 272, or equivalent
Introduction to theory and its applications in MO theory, spectroscopy, ligand field theory, and molecular structure.

CHM 555 three credits
Methods of Chemical Separation
Prerequisites: Analytical and physical chemistry with grades of C- or better
A survey and practice of modern separation methods. Topics include liquid, gas, thin layer and ion exchange chromatography; electrophoresis; sample preparation and extraction.

CHM 556 three credits
Theory of Magnetic Resonance Spectroscopy
Prerequisite: One year of physical chemistry with grades of C- or better; quantum mechanics recommended
Introduction to the theory of electron paramagnetic resonance and nuclear magnetic resonance; applications in the study of molecular structure.

CHM 560 three credits
New Synthetic Methods
Prerequisite: One year of organic chemistry with grades of C- or better; some biochemistry recommended
Survey of preparative methods in organic chemistry and their application to the synthesis of complex molecules.

CHM 562 three credits
Natural Products
Prerequisite: One year of organic chemistry with grades of C- or better
Isolation, structure elucidation, total synthesis, biosynthetic pathways, metabolism, and physiological importance and pharmacological uses of natural products.

CHM 595 three credits
Graduate Independent Study
Prerequisites: Graduate standing; permission of instructor, graduate director, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Terms and hours to be arranged.

CHM 596 three credits
Graduate Directed Study
Prerequisites: Graduate standing; permission of instructor, graduate director, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Terms and hours to be arranged. Terms and hours to be arranged.

CHM 600 three to nine credits per term
Thesis Research
Prerequisite: Departmental permission
Original chemical research and preparation of thesis. Required for Plan A master's degree. Graded P/F.

CHM 610 two to five credits per term
Project Research
Prerequisite: Departmental permission
Original chemical research, required for Plan B master's degree. Written project report required. Graded P/F.

CHM 620 two to five credits per term
Library Research
Prerequisite: Departmental permission
Survey of a particular topic in the chemical literature. Written final summary report required. Graded P/F.

CHM 650 one credit
Graduate Seminar
Lectures on current topics in chemistry from guest lecturers and students. The graduate student will present a total of two seminars, one of which will be the thesis seminar. Each graduate student is required to enroll in this course for each semester in residence. This course will not count toward the 30 credits of course work and research required for the degree.

Economics

A major in Economics provides students with a unique blend of the perspective gained from a liberal arts education and the practical skills necessary for intelligent decision-making and administration in business and government. In addition to providing a sound theoretical foundation in economic theory and economic statistics, the economics major introduces students to a variety of applied fields which focus on international, national, and regional economic problems, issues, and policies. Class sizes in major courses are relatively small, and there is much opportunity for direct contact and interaction with faculty.

Economics is the science of decision-making. Students of economics learn to identify and analyze the costs and benefits of financial and social decisions. Skills in cost-benefit analysis, the core of economists' training, are widely applicable and highly valued in current job markets.

Graduates of the economics program are prepared for and have been employed in finance, insurance, real estate (for example as real estate appraisers, stock brokers, credit analysts, loan officers, research analysts); management positions in business; economic journalism; high school teaching, public policy and government employment (federal, state, local).

Opportunities for further education include law school (JD Degree); graduate business school (MBA degree); MS degrees in accounting, business, or finance; master's degree in public policy; master's degree and PhD in economics.

Faculty and Fields of Interest

David E. Berger labor economics, regional economics

Lewis Dars micro- and macroeconomics, econometrics

Daniel L. Georgianna marine resource economics, history of economic thought

William Hogan (chairperson) economic statistics & econometrics, macroeconomics, demography

Robert Jones economics of health and medicine, public finance, microeconomics, econometrics

Joy Ongardanunkul industrial organization, antitrust, regulation, microeconomics, economic statistics

Ronald Shadbegian public economics, state and local public finance, environmental economics, microeconomics, econometrics

Sonia Walgreen economics of aging, economic development, urban economics

Economics Major
BA Degree

Students who wish to pursue a professional career in economics should plan to attend graduate school. For admission to graduate programs in Economics students should follow the curriculum of the honors major in economics and should discuss their plans with faculty advisors.

To transfer to the economics major, a student already enrolled at UMass Dartmouth in another major (or undeclared) must first complete ECO 231, Principles of Microeconomics, and ECO 232, Principles of Macroeconomics, and receive a grade point average of 2.5 or higher *in these two courses*, and have a cumulative GPA of 2.0 or higher. (For example a B and a C yield a GPA of 2.5.)

Requirements

		Credits
ECO 100	One 100-level course (optional)*	0-3
Introductory level major requirements		
ECO 231, 232	Principles of Micro, Macro	6
Core major requirements		
ECO 301, 311	Intermediate Micro, Macro	6
ECO 332	Economic Statistics	3
Upper-level electives		
ECO	15 credits of 300- or 400-level courses*	15
Research course requirements		
ECO	Two 400-level courses**	6
	Total	**36**

* Majors are encouraged to take a 100-level Economics course during their freshman or sophomore years. However, Economics majors may not take any 100-level Economics course for credit toward the major after completing any 300- or 400-level Economics course. In this case, an additional 300-level or 400-level course is required, for a total of 15 credits at the 300- or 400-level. In either case, a total of 36 credits is required in Economics courses.

** Research courses require a major research paper. All 400-level courses in Economics require a major research paper. Under some circumstances, students may be allowed to use a 300-level course toward this requirement if the course includes a requirement of a major research paper. Please see the Department Chair if you have questions.

Students must achieve a minimum cumulative grade point average of 2.000 in courses required for the Economics major.

Departmental General Education Requirements

Students majoring in Economics will meet their departmentally-controlled General Education requirements as follows:

Area E: Economics majors are required to complete both ECO 231, Principles of Microeconomics, and ECO 232, Principles of Macroeconomics. Each of these courses satisfies the Gen Ed requirement in Area E.

Area I, Tier 2: Economics majors are required to compete ECO 332, Economic Statistics to satisfy the Gen Ed Area I, Tier 2 requirement for Economics.

Area W, Tier 2: Students should select a course from the published list of available courses that satisfies this requirement. Several ECO courses have been authorized to satisfy this Gen Ed requirement.

Area O: Students should select a course from the published list of available courses that satisfy this requirement. Several ECO courses have been authorized to satisfy this Gen Ed requirement

Honors Major in Economics

Honors Major requirements are the same as specified for the regular Economics major, except that

ECO 333, Econometrics, and ECO 498, Honors Thesis, must be included as 6 of the credits among the Upper-level electives;

and

Students must achieve a minimum cumulative grade point average of 3.200 in courses required for the Economics Honors major.

Economics Minor

A minor in economics may be elected by a student majoring in any other field. Any degree candidate who has between 54 and 84 credits, with a cumulative grade point average of 2.0 and with a 2.5 grade point average in his or her major, may request admission to the minor. Before being admitted to the economics minor, student must obtain approval of the Economics Department chairperson.

Eighteen credit hours are required and must include the following courses:
ECO 231, 232, and either 301 or 311 (9 credits). The remaining 9 credits must be selected from courses in economics numbered ECO 300 or higher. Independent study, directed study, or experiential learning may not be applied toward the minor. Students must have, at the time of graduation, an average of at least 2.5 in all courses taken in economics to qualify for the minor.

Economics Courses

ECO 101 three credits **E, G**
Contemporary Issues in Economics
Basic economics concepts are used to analyze issues of social responsibility at global and domestic levels. Topics such as national health, aging and care of the elderly, economics of professional sports, pollution, governmental control of prices, inflation unemployment, the national debt, and economic growth are covered.

ECO 103 three credits **D, E, O**
Cities, Minorities, and Poverty
Review and analysis of major social problems faced by cities; emphasis on origin, causes and possible solutions for poverty and minority problems. Cross-listed as AAS 103, LST 103, and WMS 103.

ECO 105 three credits
Economic Development
The meaning of economic development. The interaction of economic, social and cultural forces in development. Widely different time periods will be considered.

ECO 107 three credits
Economics of Pollution
Basic economic analysis of pollution control. A growing concern of policy-makers is how to achieve both economic growth and a cleaner environment. We will examine issues such as how the EPA sets ambient air quality standards and how we can achieve those standards in a cost-effective way.

ECO 111 three credits **D, E, O**
Jobs and Discrimination
Basic analysis of problems of economic growth, job creation, and unemployment; structure of work and jobs will be explored, along with current issues surrounding the government's impact on inflation, taxation, and economic planning. Cross-listed as LST 111 and WMS 111.

ECO 231 three credits **E, G**
Principles of Microeconomics
Prerequisites: none
Survey of the American economy focusing on markets, the price system, and resource allocation. Price determination in competitive and imperfectly-competitive markets. Applications in agricultural economics, legal prices, excise taxes, labor market issues, advertising, technological change, pollution and the environment, public goods, antitrust policy, international trade, and alternative economic systems.

ECO 232 three credits **E, G**
Principles of Macroeconomics
Prerequisites: None. This course may be taken before ECO 231.
Survey of introductory macroeconomics with focus on economic growth, unemployment, and inflation. Topics covered include national income accounting, inflation, unemployment, fiscal policy, money, the banking system, and monetary policy are covered. Balance of payments and currency exchange rate issues are analyzed.

ECO 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see section of catalogue on Other Learning Experiences. In this department, students may receive credit only for experiences in which they do not receive pay for the same work.

ECO 301 three credits
Intermediate Microeconomics
Prerequisites: ECO 231, 232; or permission of instructor
Contemporary intermediate treatment of microeconomic theory, applications, and price policy. Covers the theory of price determination, resource allocation, income distribution, and welfare economics. Perfectly competitive markets and models of imperfect competition are covered. Theory is integrated with public policy questions.

ECO 311 three credits
Intermediate Macroeconomics
Prerequisites: ECO 231, 232; or permission of instructor
A one-semester course in contemporary intermediate macro theory. Covers issues in economic growth, unemployment, and inflation. Develops and contrasts the New Classical (equilibrium) and Neo-Keynesian (disequilibrium) models in the aggregate demand/aggregate supply framework for both closed and open economies. Policy implications of each model are discussed. Introduces students to sources of macroeconomic data.

ECO 321 three credits
Comparative Economic Systems
Prerequisites: ECO 231, 232
Comparisons in terms of structure and performance between different types of market economies, ranging from smaller to larger public sectors, market socialist economies, and mixed economies. The case study method is used, taking examples from the economies of the European Union, export-oriented Asian economies, and less developed African and South American economies.

ECO 331 three credits
Economics of Developing Countries
Prerequisites: ECO 231, 232
A study of economic development in Third World nations. Emphasis is on the analysis of critical development problems from a combined theoretical, empirical, and policy-oriented perspective. The course will also explore the historical, political, social, and economic roots of underdevelopment and the future of the world economy in an age of increasing interdependence.

ECO 332 three credits
Economic Statistics
Prerequisites: ECO 231, 232, and 3 credits of MTH; or permission of instructor
Introduction to data and statistical methods used in economics. Descriptive statistics, probability distributions, sampling, estimation, confidence intervals, hypothesis testing, correlation, and regression including multiple regression are covered. Applications in economics with current economic data are emphasized.

ECO 333 three credits
Econometrics
Prerequisite: ECO 332; or permission of instructor
Introduction to econometrics including development of basic techniques of bivariate and multivariate linear regression analysis; use of lagged variable and dummy variables in model building; problems of multicollinearity, autocorrelation and heteroscedasticity.

ECO 335 three credits
Resource Economics
Prerequisites: ECO 231, 232; or permission of instructor
The economics of renewable and non-renewable, common and private resources. The focus of this course will be comparison between markets and planning in the use of resources; the international distribution and use of resources will also be covered.

ECO 337 three credits
Environmental Economics
Prerequisite: ECO 231
This course will study the fascinating and growing field of environmental and natural

resource economics. All the topics covered (e.g., property rights and externalities, regulation and pollution control) will be examined as part of the general focus on the problem of economic growth in the presence of limited environmental and natural resources. We will employ the tools from 'basic' microeconomic theory to study the relationship between the economy and the natural environment.

ECO 338 three credits
Health Economics
Prerequisites: ECO 231, 232
Methodologies used by economists to study the economics of health. Topics covered include market for health care, demand for insurance, demography and health, and cross-national comparisons of medical care systems.

ECO 342 three credits
Labor Economics
Prerequisites: ECO 231, 232; or permission of instructor
The labor force. Wages in competitive and non-competitive markets. Wage structures. Inequalities and discrimination. Impacts of unions and social standards. Indexation, inflation and unemployment. Cross-listed as LST 342.

ECO 343 three credits **E, G**
The Economics of Sex and Race Discrimination
Prerequisites: ECO 231, 232; or permission of instructor
The theory of labor markets and the problem of discrimination. Current problems facing women and minorities will be examined. Existing programs and trends will be explored. Cross-listed as AAS 343, LST 343, and WMS 344.

ECO 344 three credits
Work, Jobs, and Income
Prerequisites: ECO 231, 232; or permission of instructor
Study of changes in the labor force, the impact of labor market processes and how they effect work motivation, job performance and income distribution. Formerly ECO 453, and may not be repeated under this new number. Cross-listed as LST 344 and WMS 344.

ECO 345 three credits
Education, Work, and Discrimination
Prerequisite: Any 100 or 200 level economics course; or permission of instructor
Examination of the economic and social issues associated with education and training which include productivity, employment, wages, and income distribution. Includes topics on testing, discrimination, poverty, and taxation. Cross-listed as LST 345 and WMS 345.

ECO 355 three credits
Antitrust Law and Economics
Prerequisite: ECO 231
The main antitrust laws and the rich variety of court decisions that have influenced decades of economic activity. The arguments of the plaintiffs and prosecution are discussed and evaluated as well as the majority and minority opinions of the Court. Economic analysis is employed to view the economic motives of the firms involved. Students learn about monopolization cases from the famous ALCOA case (1945) to the Microsoft antitrust case. Precedent-setting cases involving "price fixing," exchange of price information, exclusive dealing, tying contracts, price discrimination and mergers are analyzed.

ECO 362 three credits
Monetary Theory and Policy
Prerequisites: ECO 231, 232
Structure of the American monetary and banking system. Monetary theory is developed and monetary policies are considered.

ECO 366 three credits
Economics of Aging
Prerequisites: ECO 231, 232; or permission of instructor
Economic issues associated with "growing older" as well as issues and policies related to "being older"; including the economic status of the elderly, economic implications of paid work or retirement, the economic impact of social security, health care needs, and costs. Cross-listed as GRT 366.

ECO 371 three credits
International Trade
Prerequisites: ECO 231, 232
Examination of international trade theory and policy. The course develops the theoretical framework for analyzing the potential gains from, direction of, and distributional effects of international trade as well as the potential impacts of tariffs and other policies affecting trade. Among other topics, the course will examine free trade versus protectionism, governmental promotion of competitiveness and the growing importance of trading blocs.

ECO 372 three credits
International Finance
Prerequisites: ECO 231, 232
Examination of international monetary theory and policy. The course develops the basic analytical tools for analyzing monetary relations among nations. The causes and effects of foreign exchange rate changes are explored. Macroeconomic interdependence among nations and its implications for policy are examined. The pros and cons of alternative international monetary systems are compared.

ECO 401 three credits
Industrial Organization and Antitrust Policy
Prerequisite: ECO 231, 232; or permission of instructor
Development of antitrust policy in the U.S. Discussion of tying arrangements, vertical integration, price discrimination, market structure and technological innovation, diversification, mergers, and patents. Theoretical and empirical discussion of barriers to new competition in American industries.

ECO 402 three credits
Economics of Regulation
Prerequisite: ECO 231, 232
The impact of state and federal government economic and social regulation on industrial economics. Topics include economic regulation of the financial sector and natural monopoly situations (electric power, natural gas, and local telephone service); common resource problems—broadcasting; social regulation of health, safety, and the environment; and deregulation of transportation industries.

ECO 416 three credits
History of Economic Thought
Prerequisites: ECO 231, 232
The development of economic thought with emphasis on the period beginning with Adam Smith and ending with J.M. Keynes. Methodological issues in economics are also considered, and questions concerning the current status and the future directions of the profession are addressed. Cross-listed as LST 416.

ECO 417 three credits **E, O, W**
Economics and Population Analysis
Prerequisites: ECO 231, 232 if economics major; or permission of instructor
The measurement and behavior of the major demographic variables, fertility, mortality, and migration, and their role in determining the growth and age distributions of populations. Applications include historical demography, the relation of population

growth to economic development, urban concentration and crowding, environmental deterioration, the aging of populations, and zero population growth. Population policy and prospects for both the near future and the longer run are also considered. Students at the junior or senior level in majors other than economics are encouraged to consider this multidisciplinary course even though they may not have taken ECO 231 and ECO 232.

ECO 441 three credits
Public Economics I
Prerequisites: ECO 231, 232, 301; or permission of instructor
First of a two semester inquiry into the role of government in a market economy. Topics include economic efficiency and the public interest, rationale for government intervention in the private sector and an economic model of the democratic process.

ECO 442 three credits
Public Economics II
Prerequisites: ECO 231, 232, 301, 441; or permission of instructor.
Concerns itself with the economic and behavioral effects of government's spending tax policies. Topics include the effect of tax policy on private investment, saving and labor supply, as well as other issues related to the effects of different government economic policies.

ECO 443 three credits
State and Local Public Economics
Prerequisites: ECO 231 and upper-class standing
Explores the major economic decisions of subnational governments—taxation and expenditures—and how these decisions affect the allocation of private resources. Specifically, the course focuses on the constraints imposed on state and local governments that are not placed on the federal government.

ECO 452 three credits
Labor and Regional Growth
Prerequisites: ECO 231, 232; or permission of instructor
Review of labor market problems and programs in growing and depressed regions, with special emphasis on New England. Attention focused on the impact of education, training and government manpower programs. Cross listed as LST 452.

ECO 461 three credits
Urban Economics
Prerequisites: ECO 231, 232; or permission of instructor
An examination of the economics of urban areas, with an emphasis on the location decision of individuals, firms, and industries. Urban problems and public policy decision-making are covered.

ECO 472 three credits
Coastal Resource Economics
Prerequisites: ECO 231, 232; or permission of instructor
An examination of the economic, public policy and regulatory issues affecting coastal zone resources. The focus will be on specific case studies with an emphasis on examining policy and environmental issues. Students will be involved in projects on specific cases.

ECO 492 three credits
Senior Seminar
Prerequisites: ECO 231, 232, and a 300 or 400 level Economics course. Permission of instructor required if prerequisites are not met.
In-depth coverage of an economic topic of contemporary interest; research paper required.

ECO 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

ECO 196, 296, 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

ECO 498 three credits
Honors Thesis
Prerequisite: Junior or Senior Economics Majors enrolled in the Economics Honors Major, and permission of instructor.
Research and preparation of an honors thesis in partial fulfillment of the requirements for the Economics Honors Major. May be taken for credit more than once, up to total 6 credits.

Education

The Education Department is committed to the preparation of educators who have a sensitivity toward multicultural issues, an awareness of the particular concerns of urban education, knowledge of the unique needs and styles of individual learners, and a conscious knowledge of the role of schools in promoting social justice in the 21st Century. Our mission is to deliver clearly defined teacher preparation programs at the undergraduate, post baccalaureate, and graduate levels. In addition to a rigorous preparation in subject-matter fields, teacher candidates develop their ability to apply pedagogical theory to practice and reflect on the complexities inherent in their craft.

Faculty and Fields of Interest

Trina Crowley (director of teacher certification) science education, curriculum development, physical education, public school K-12 administration

Anne Foley literacy, curriculum design, instructional development, reading comprehension, professional development, special education, program evaluation, teaching English as a second language, school library media

Cynthia Kruger middle and secondary education, curriculum development, methodology, social studies, reading, inclusive education

Elementary, Middle, and Secondary Initial Licensure Programs

Initial License Program, Route One
The Education Department offers a sequence of courses at the undergraduate level in preparation for the initial teaching license. All interested undergraduates should meet with a member of the Education Department early in their academic career to apply to the program and to develop their plan of study. To prepare for an initial license at the elementary, middle, and high school levels, Route One students complete their academic major requirements, a sequence of education courses that include prepractica in local area schools, and one full semester of student teaching. Students pursuing Route One need to complete specific Arts and Sciences coursework and pass the required state tests for their specific teacher license.

Initial License Program, Route Two Post Baccalaureate
Teacher candidates who already hold an undergraduate degree from an accredited four year institution may earn an initial license by following a sequence of courses at the post baccalaureate level in preparation for the initial teaching license. To prepare for an initial license at the elementary, middle, and high school levels, Route Two students must successfully pass state tests and complete the sequence of education courses. The Post-Baccalaureate program includes content courses that require prepracticum assignments in local area schools and one full semester of student teaching, For those already teaching, a supervised internship may be arranged.

Art Education and Music

See the sections elsewhere in this catalogue for information about admission to and progression in these programs.

Contacts: Marie Nelson, Director of Music Education (508 999-8568)
Arlene Mollo, Chairperson, Art Education Department (508 999-8548)

Initial Licensure Programs

Route One:
Undergraduate Initial License

Elementary Education Teacher (1-6)
Teacher of Biology (8-12)
Teacher of English (5-8) (8-12)
Teacher of Foreign Languages-French (5-12)
Teacher of Foreign Languages-Portuguese (5-12)
Teacher of Foreign Languages-Spanish (5-12)
Teacher of History (5-8) (8-12)
Teacher of Mathematics (5-8) (8-12)
Teacher of Music: Vocal/ Instrumental/ General (ALL levels)
Teacher of Political Science /Political Philosophy (5-8) (8-12)
Teacher of Physics (8-12)
Teacher of Visual Art (PreK-8) (5-12)

Route Two:
Post-Baccalaureate Program Initial License

Elementary Education Teacher (1-6)
Teacher of Biology (8-12)
Teacher of English (5-8) (8-12)
Teacher of Foreign Languages-French (5-12)
Teacher of Foreign Languages-Portuguese (5-12)
Teacher of Foreign Languages-Spanish (5-12)
Teacher of History (5-8) (8-12)
Teacher of Mathematics (5-8) (8-12)
Teacher of Political Science /Political Philosophy (5-8) (8-12)
Teacher of Physics (8-12)
Teacher of Visual Art (PreK-8) (5-12)

Note: The above programs are offered by departments in the College of Arts and Sciences, with the following exceptions. The College of Visual and Performing Arts offers Teacher of Visual Art licensure through academic programs at both bachelor's and master's levels and Teacher of Music licensure through an option in the Music BA program. Teacher of Physics licensure is offered through the Department of Physics in the College of Engineering.

Admission, Progression, and Licensure

Requirements for admission to the teacher preparation program

- Submit a completed application and transcript with a cumulative GPA of 2.75 or higher
- Be formally accepted into an appropriate UMass Dartmouth degree program or possess a BA or BS degree
- Participate in a preliminary advising interview with a member of the Education Department
- Have received a passing score on the Communication and Literacy Skills Test (CLST-01) of the Massachusetts Test of Educator Licensure (MTEL)
- Route Two candidates must possess a BS or BA degree and have passed all required MTEL tests, including the MTEL Communication and Literacy Skills Test and the appropriate MTEL Content Knowledge test, before acceptance into the program.

Elementary Education Initial License, Undergraduate Students—Route One

Admission to the program requires passing the MTEL Communication and Literacy Skills tests and meeting other entrance requirements. The undergraduate Elementary Initial Licensing Teacher Preparation Program may require four and a half to five years to complete.

Requirements for the initial license program		Prerequisites	Credits
EDU 207	Teaching as a Profession		3
MTH 108	Mathematics for Elementary Teachers		3
PSY 201	Child Psychology	PSY 101	3
EDU 303	Science for Elementary Teachers		3
EDU 220	Teaching Reading	EDU 207; admission to program	3
EDU 304	Language Arts	EDU 207, 220; admission to program	3
EDU 327	Integrated Instructional Planning K-12	EDU 207; admission to program	3
EDU 329	Integrated Content Methods Elementary	EDU 207, 220, 303, 304, 327; admission to program	3
EDU 347	Teaching and Managing Inclusive Classrooms K-12	EDU 207; admission to program	3
EDU 414	Elementary Practicum	Passing score on MTEL: Communication and Literacy Skills (01) Elementary Content (06) Foundations of Reading (90)	12
EDU 416	Elementary Seminar	Passing score on MTEL: Communication and Literacy Skills (01) Elementary Content (06) Foundations of Reading (90)	3

Cumulative GPA 2.75
Passing above courses, B- or better

Completion of a Professional Capstone Portfolio

Total **42**

In addition to the above requirements students must choose electives (at least 36 credits) in composition; American literature; world literature, including British Literature; U.S. history from colonial times to the present; world history, including European history, from ancient times to the present; geography; economics; U.S. government including founding documents; child development; science laboratory work; and appropriate mathematics and science coursework. Some of this coursework might also count toward the required arts or sciences major or general education requirements. (These subjects are emphasized in the state curriculum frameworks for grades 1-6 and will be included in the content portion of the MTEL.)

Please note: Program requirements will be revised to reflect on-going developments in state regulations and educational reform.

Elementary Education Initial License, Post Baccalaureate Students—Route Two

Admission to the program requires possession of an appropriate bachelor's degree, passing the MTEL Communication and Literacy Skills and the appropriate MTEL Content Area tests, and meeting other entrance requirements.

Requirements for the initial license program		Prerequisites	Credits
EDU 207	Teaching as a Profession		3
MTH 108	Mathematics for Elementary Teachers		3
PSY 201	Child Psychology	PSY 101	3
EDU 303	Science for Elementary Teachers		3
EDU 520	Teaching Reading in the Elementary School	EDU 207; admission to program	3
EDU 504	Language Arts	EDU 207, 520; admission to program	3
EDU 527	Integrated Instructional Planning K-12	EDU 207; admission to program	3
EDU 529	Integrated Content Methods Elementary	EDU 207, 520, 503, 504, 527; admission to program	3
EDU 547	Teaching and Managing Inclusive Classrooms K-12	EDU 207; admission to program	3
EDU 514	Elementary Practicum	Passing score on MTEL: Communication and Literacy Skills (01) Elementary Content (06) Foundations of Reading (90)	12
EDU 516	Elementary Seminar	Passing score on MTEL: Communication and Literacy Skills (01) Elementary Content (06) Foundations of Reading (90)	3
Cumulative GPA 2.75 Passing above courses, B- or better			
Completion of a Professional Capstone Portfolio			
		Total	**42**

Please note: Program requirements will be revised to reflect on-going developments in state regulations and educational reform. The above courses may not be applied to the MAT degree.

Middle/Secondary School Education Licensure, Undergraduate Students—Route One

Admission to the program requires passing the MTEL Communication and Literacy Skills tests and meeting other entrance requirements.

Requirements for initial license program		Prerequisites	Credits
EDU 207	Teaching as a Profession		3
PSY 215	Adolescent Psychology	PSY 101	3
EDU 325	Reading in the Content Areas, Middle/Secondary	EDU 207; admission to program	3
EDU 326	Contemporary Middle and High school Education	EDU 207; admission to program	3
EDU 327	Integrated Instructional Planning K-12	EDU 207; admission to program	3
EDU 347	Teaching and Managing Inclusive Classrooms, K-12	EDU 207; admission to program	3
XXX xxx	One Content Pedagogy/Methods Course (One methods course in all majors, except that Spanish and French require three methods courses—FLL 322, FLL 324, FLL 326, and Portuguese two methods courses, POR 321/521 and one of the above FLL courses.		3
EDU 415	Middle/Secondary Practicum	MTEL Content area	12
EDU 417	Middle/Secondary Workshop	MTEL Content area	3

Cumulative GPA 2.75
Passing above courses, B- or better

Completion of a Professional Capstone Portfolio

Total **36**

Please note: Program requirements will be revised to reflect on-going developments in state regulations and educational reform.

Middle/Secondary School Education Licensure, Post Baccalaureate Students—Route Two

Admission to the program requires possession of an appropriate bachelor's degree, passing both the Communication and Literacy Skills Test and appropriate content knowledge test (MTEL), and meeting other entrance requirements.

Requirements for initial license program		Prerequisites	Credits
EDU 207	Teaching as a Profession		3
PSY 215	Adolescent Psychology	PSY 101	3
EDU 525	Reading in the Content Areas, Middle/Secondary	EDU 207; admission to program	3
EDU 526	Contemporary Middle and High School Education	EDU 207; admission to program	3
EDU 527	Integrated Instructional Planning K-12	EDU 207; admission to program	3
EDU 547	Teaching and Managing Inclusive Classrooms K-12	EDU 207; admission to program	3
XXX xxx	One Content Pedagogy/Methods Course (One methods course in all majors, except that Spanish and French require three methods courses—FLL 322, FLL 324, FLL 326, and Portuguese two methods courses, POR 321/521 and one of the above FLL courses.		3
EDU 515	Middle/Secondary Practicum	MTEL Content area	12
EDU 517	Middle/Secondary Workshop	MTEL Content area	3

Cumulative GPA 2.75
Passing above courses, B- or better

Completion of a Professional Capstone Portfolio

Total **36**

Please note: Program requirements will be revised to reflect on-going developments in state regulations and educational reform. The above courses may not be applied to the MAT degree.

EDU 201 three credits
Philosophy of Education
An introduction to major issues and problems in philosophy of education. Examination is undertaken of some of the traditional areas of philosophical concern and their relevance to the teacher-learning process.

EDU 205 three credits
Human Development and Learning
A study of central development tendencies and stages as these underlie the unfolding of human potentialities. Consideration will be given to those conditions and factors which influence learning and forgetting. The nature of intelligence, the nature of learning, and the meaning of personality will be examined in the context of the teacher-learning process. This course meets the Massachusetts Office for Children requirements for day care center certification, OFC Category A, Child Growth and Development.

EDU 207 three credits
Teaching as a Profession
Includes 15 hours pre-practicum
Introduces students considering education as a career to the real world of teaching through an in-depth, candid analysis of the teaching profession today. This interactive course explores the challenges and rewards of teaching, studies the history, philosophy, sociology, and politics of American education, and focus on the major educational issues, trends, and reform movements. Students complete 15 pre-practicum hours in a service learning experience involving intensive tutoring of a student at the grade level they hope to teach and 10 hours of observation of teachers in classrooms. Students study theoretical aspects of cooperative learning and constructivism and practice them first hand through discussion groups and work teams.

EDU 220 three credits
Teaching Reading in Elementary Schools
Includes 20 hours pre-practicum
The nature of literacy, its development, and its application in a diverse society. The course explores, through a variety of perspectives, how to teach reading and writing considering the lives and needs of children. Theory and application are linked to provide future teachers with the skills necessary to assist their students in finding vital meaning and uses in their lives for these and all other forms of communication. Offered at the post-baccalaureate level as EDU 520.

EDU 273 variable credits
Non-Traditional Prior Learning
Students prepare a portfolio to document non-traditional prior learning, for review by department(s) in consideration of award of credit.

EDU 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

EDU 303 three credits
Science for Elementary Teachers
Includes 20 hours pre-practicum
A content/methods course designed to integrate four important aspects of teaching science in the elementary school: becoming a reflective practitioner, gaining knowledge of oneself as a learner of science, gaining knowledge of oneself as a teacher of science, and gaining knowledge of children. This course prepares one to craft a science teaching practice that reflects current science educational research, philosophies, and methodologies.

EDU 304 three credits
Language Arts
Includes 20 hours pre-practicum
Prerequisites: EDU 207, 220; acceptance to the teacher preparation program
Builds upon the process of learning to read and write developed in EDU 220/520 and shifts the focus toward how teachers deepen children's understanding of reading and writing, to support and engage children in using reading and writing in the content areas. The course examines current research, methods, strategies, and best practices. Offered at the post-baccalaureate level as EDU 504.

EDU 325 three credits
Reading in the Content Areas: Middle and Secondary
Prerequisite: EDU 207; acceptance to the teacher preparation program
Includes 20 hours pre-practicum
Examination of the field of reading and how to incorporate the development of reading and comprehension skills into content areas in meaningful ways. This course is developed for students who are preparing to become teachers in content areas in middle and secondary schools Previously offered as EDU 315. Offered at the post-baccalaureate level as EDU 525

EDU 326 three credits
Contemporary Middle and High School Education
Includes 25 hours pre-practicum
Prerequisite: EDU 207; acceptance to the teacher preparation program
Equity, diversity, motivation, alternative assessment, multicultural education, and the social problems of adolescents. The course covers provisions for the inclusion of special-needs students, as mandated by state and federal legislation, and addresses outcome-based education and open-ended assessment. Extensive reading assignments, written reporting, action research varied assessments, and a demonstration project will prepare future teachers to meet exacting certification requirements and gain teaching competencies. Offered at the post-baccalaureate level as EDU 526.

EDU 327 three credits
Integrated Instructional Planning, K-12
Includes 20 hours pre-practicum
Prerequisite: EDU 207; acceptance to the teacher preparation program
Generic/integrated approach to classroom curriculum and pedagogy for prospective teachers at all levels and disciplines. Particular attention is paid to learning plans that respond to diversity, learning needs, and learning styles of all students, including unit and lesson construction, varied learning strategies, material construction, audio-visual, technology, and classroom evaluation. Offered at the post-baccalaureate level as EDU 527.

EDU 329 three credits
Integrated Content Methods, Elementary
Includes 30 hours pre-practicum
Prerequisites: EDU 207, 220, 327, 303, 304; EDU 329 may be taken concurrently if approved by department; acceptance into the teacher preparation program
Teaching of content areas in the elementary classroom in meaningful ways that help students construct their own understandings. This course uses a variety of activities to help prospective teachers become prepared for teaching the content areas in ways that engage their students creatively. Students integrate the information and skills gained in reading and language arts courses with content areas of mathematics, science, and social studies. Using course readings

and field experiences, students develop material and design curriculum units based on a thorough knowledge of the Massachusetts Curriculum Frameworks. Offered at the post-baccalaureate level as EDU 529.

EDU 330 three credits
Teaching Methods and Materials in Managing Business Education
Prerequisite: EDU 207 or equivalent
Basic methods and materials that relate to the instruction of business education. Particular emphasis will be devoted to teaching and developing alternative curricula designs and resource units in a variety of business subjects.

EDU 347 three credits
Teaching and Managing Inclusive Classrooms, K-12
Prerequisite: EDU 207; acceptance to the teacher preparation program
Inclusive education viewed from historical, legal, and practical perspectives for the inclusive classroom. Organizational restructuring, philosophical implication, educational diversity, goal setting, curriculum modification, diverse content instructional models, and alternative assessment prepare the future teacher for effective responses to differing student learning styles, rates, and needs. Research into the literature, development of an IEP, curriculum and lesson planning, material development, and classroom management provide essential professional skills for the K-12 inclusionary-classroom teacher. Offered at the post-baccalaureate level as EDU 547.

EDU 350 three credits
Educational Research
Prerequisite: Acceptance to the teacher preparation program or permission of instructor
Prepares students to evaluate work conducted in the area of educational research. Both quantitative and qualitative education research are investigated.

EDU 353 three credits
Education: Administration and Supervision
Prerequisite: Acceptance to the teacher preparation program
General introduction to contemporary practices and policies in educational administration and supervision. Instruction is by lecture, case studies, and student reports. Topics covered include curriculum planning and design, staff organizations and relationships, and student and community relationships.

EDU 370 three credits
Urban Education
Prerequisite: Acceptance to the teacher preparation program or permission of instructor
Designed to offer a broad focus on the urban student as contrasted with his/her rural/suburban counterpart. Current educational problems with historical perspectives speak to reform and change in urban schools and community settings.

EDU 376 three credits
Using Educational Technology in Educational Settings
Prerequisite: Familiarity with personal computing and word processing and acceptance to the teacher preparation program; or permission of instructor
Exploration of educational technology as a tool to support teaching and learning at elementary and secondary levels. Computer software, CD ROM and laser disk applications, educational telecommunications, and network resources are examined.

EDU 409 three credits
Sociology of Education
Prerequisite: Acceptance to the teacher preparation program or permission of instructor
A study of social processes underlying education. Major areas covered include the current social forces affecting education, the place of the school in American culture, the impact of social stratification on education, and the role of the teacher in a period of rapid social change.

EDU 410 three credits
Educational Tests and Measurements
Prerequisite: Acceptance to the teacher preparation program or permission of instructor
Assists the student in evaluating educational tests and measurements conducted in the area of descriptive and inferential statistics. Concepts such as central tendency, correlation, regression, variability, T-test, analysis of variance, Chi-square, and hypothesis testing are presented in depth.

EDU 414 twelve credits
Practicum (Elementary)
Prerequisites: All program coursework completed with B- or better in each course; 2.75 GPA; and passing score on the Elementary Content Area and Foundations of Reading tests of the MTEL
Corequisite: EDU 416
A fifteen-week full-time classroom experience under the direction of university faculty and cooperating classroom teachers. Offered at the Post-baccalaureate level as EDU 514.

EDU 415 twelve credits
Practicum (Middle and Secondary)
Prerequisites: All program coursework completed with B- or better in each course; 2.75 GPA; and passing score on the appropriate Content Area of the MTEL
Corequisite: EDU 417
A fifteen-week full-time classroom experience under the direction of university faculty and cooperating classroom teachers. Offered at the Post-baccalaureate level as EDU 515.

EDU 416 three credits
Seminar, Elementary
Corequisite: EDU 414
Small group meetings, workshops, and discussions with university faculty and other key school personnel about critical incidents and issues arising from and related to the student teachers' actual teaching experiences. Offered at the Post-baccalaureate level as EDU 516.

EDU 417 three credits
Seminar, Middle and Secondary
Corequisite: EDU 415
Small group meetings, workshops, and discussions with university faculty and other key school personnel about critical incidents and issues arising from and related to the student teachers' actual teaching experiences. Offered at the Post-baccalaureate level as EDU 517.

EDU 451 three credits
Contemporary Issues and Challenges
Prerequisite: Acceptance to the teacher preparation program or permission of instructor
Contemporary problems such as drugs, violence, sexism, and racism, in relation to the school setting. Cross-listed as AAS 451 when the subject is related to that minor.

EDU 495 three credits
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Individual study of additional areas needed for teacher certification, including methods in specific disciplines, reading, etc. Terms and hours will be arranged. Confer with appropriate members of the Education Department.

EDU 196, 296, 396, 496 three credits

Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged. Confer with Department Chairperson and Director of Teacher Certification.

Post-Baccalaureate Courses for Initial License

EDU 504 three credits
Language Arts
Includes 20 hours prepracticum
Prerequisite: EDU 207, EDU 520; acceptance to the teacher preparation program
Same as EDU 304 except that graduate level students attend a series of three seminars and complete assignments additional to those required of undergraduates.

EDU 520 three credits
Teaching Reading in Elementary Schools
Includes 20 hours prepracticum
Prerequisite: EDU 207; acceptance to the teacher preparation program
Same as EDU 220 except that graduate level students attend a series of three seminars and complete assignments additional to those required of undergraduates.

EDU 525 three credits
Reading in the Content Areas: Middle and Secondary
Includes 20 hours prepracticum
Prerequisite: EDU 207, acceptance to the teacher preparation program
Same as EDU 325 except that graduate level students attend a series of three seminars and complete assignments additional to those required of undergraduates.

EDU 526 three credits
Contemporary Middle and High School Education
Includes 25 hours prepracticum
Prerequisite: EDU 207; acceptance to the teacher preparation program
Same as EDU 326 except that graduate level students attend a series of three seminars and complete assignments additional to those required of undergraduates.

EDU 527 three credits
Integrated Instructional Planning, K-12
Includes 20 hours prepracticum
Prerequisite: EDU 207; acceptance to the teacher preparation program
Same as EDU 327 except that graduate level students attend a series of three seminars and complete assignments additional to those required of undergraduates.

EDU 529 three credits
Integrated Content Methods, Elementary
Includes 30 hours prepracticum
Prerequisites: EDU 207, 303, 504, 520, 527; EDU 529 may be taken concurrently if approved by department; acceptance to the teacher preparation program
Same as EDU 329 except that graduate level students attend a series of three seminars and complete assignments additional to those required of undergraduates.

EDU 547 three credits
Teaching and Managing Inclusive Classrooms, K-12
Prerequisite: EDU 207; acceptance to the teacher preparation program
Same as EDU 347 except that graduate level students attend a series of three seminars and complete assignments additional to those required of undergraduates.

EDU 514 three credits
Practicum, Elementary
400 hours supervised student teaching
Prerequisites: EDU 504, 520, 527, 547, BIO 600, content methods course (or Music Education course sequence); and passing score on the Elementary Content Area of the MTEL
Corequisite: EDU 516
A fifteen-week full-time classroom experience under the direction of university faculty and cooperating classroom teachers.

EDU 515 three credits
Practicum, Middle and Secondary
400 hours supervised student teaching
Prerequisites: EDU 525, 527, 547, content methods course (or Music Education course sequence); and passing score on the appropriate Content Area of the MTEL
Corequisite: EDU 517
A fifteen-week full-time classroom experience under the direction of university faculty and cooperating classroom teachers.

EDU 516 three credits
Seminar, Elementary
Corequisite: EDU 514
Small group meetings, workshops, and discussions with university faculty and other key school personnel about critical incidents and issues arising from and related to the interns' actual teaching experiences.

EDU 517 three credits
Seminar, Middle and Secondary
Corequisite: EDU 515
Small group meetings, workshops, and discussions with university faculty and other key school personnel about critical incidents and issues arising from and related to the interns' actual teaching experiences.

Graduate Education Courses for the Masters of Art in Teaching

EDU 551 three credits
Contemporary Issues and Challenges
A variable-topics course for education topics of current interest. Recently offered topics include authentic assessment, leadership mentoring, and teaching and learning intuition.

EDU 610 three credits
Developmental Language Arts
Surveys methods of teaching the language arts which take into consideration elementary and middle school students' needs and abilities.

EDU 611 three credits
Developmental Reading
A study of the cultural, social and psycholinguistic principles, strategies and practices underlying reading and learning to read.

EDU 612 three credits
Teaching Writing in the Elementary and Middle School
A developmentally appropriate model to provide participants with the theory, the tools, and the support to create a writing program in their classrooms.

EDU 613 three credits
Literature for the Elementary and Middle School Child
Introduces methods of bringing literature to children grades K-8.

EDU 615 three credits
Current Trends in the Teaching of Social Studies in Elementary and Middle Schools
Social studies as a tool to help young people develop the ability to make informed decisions for the public good as citizens of a culturally diverse, democratic society in an independent world.

EDU 625 / FLL 625 three credits
Alternative Assessment and The National Standards in Foreign Language Education
A critical examination of recent theory and

practice concerning the role of assessment in foreign language curricula.

EDU 662 three credits
The Newspaper as a Tool for Reading Instruction
Analysis of basic reading skills (comprehension, vocabulary development) and transfer of these basic skills to content area reading. Identification of specific reading needs, correlation of reading instruction with a student need assessments, and the development of reading material reflecting reading skills and student needs are also addressed through the use of the newspaper as a tool in reading instruction. This reading course is designed for teachers in grades K-12.

Master of Arts in Teaching Core Courses

These courses may be taught by faculty from various departments in the College. Full course descriptions are available in the *Graduate Catalogue*.

MAT 601 three credits
Curriculum Design and Implementation
Prerequisite: MAT enrollment or permission of instructor
A study of curriculum dimensions, concepts, design, and products for varied student populations and school settings. This course focuses on curriculum planning on multicultural and multisector levels, research of curriculum development, and the study of curriculum issues, trends, and innovations.

MAT 603 three credits
Foundations of Education
Prerequisite: MAT enrollment or permission of instructor
A study of insights which various disciplines can offer to the discussion of major educational issues, policies, and trends. The disciplines of philosophy, psychology, sociology, and history will provide the intellectual foundation designed to develop an awareness of and critical disposition to pressing educational concerns.

MAT 605 three credits
Effective Research Methods
Prerequisite: MAT 603
The techniques and criteria for understanding and conducting research in education with emphasis on action research. Topics include research strategies, secondary literature review, research design, data collection, research techniques, and the completion of a research proposal for a Thesis Research Project.

MAT 606 three credits
Thesis Research Project
Prerequisite: MAT 605 or equivalent
Researching an applied, experimental, or theoretical problem in education with an emphasis on action research, its application to K-12 teaching and learning, and the professional development of the researcher. The research will lead to a Thesis Research Report which requires approval by the candidate's Thesis Research Project Committee for the awarding of an MAT degree.

MAT 609 three credits
Effective Instruction—Research Based Models
Prerequisite: MAT enrollment or permission of instructor
Translating the results of research into practical, usable, and theoretically sound strategies that teachers can use in today's diverse classrooms.

Other Graduate MAT Courses

MAT 650 one to four credits (usually three)
Seminar: Contemporary Issues in Teaching and Education
An investigation of current issues in education. The seminar will bring together area teachers and administrators, faculty, and invited experts across grade-level divisions, but on some occasions, sessions may be held covering topics that will be considered for a particular grade level. May be repeated with change of content.

MAT 699 three credits
Graduate Thesis
Prerequisites: MAT candidacy and MAT 605 or equivalent
Thesis research and writing. Submission of formal thesis is required for awarding of credit. Graded P/F.

Interdisciplinary Courses for the Master of Arts in Teaching

MAT 650 one to four credits (usually three)
Seminar: Contemporary Issues in Teaching and Education
An investigation of current issues in education. The seminar will bring together area teachers and administrators, faculty, and invited experts across grade-level divisions, but on some occasions, sessions may be held covering topics that will be considered for a particular grade level. May be repeated with change of content.

MAT 695 three credits
Internship
A fifteen week full-time classroom experience under the mentoring of university faculty and cooperating classroom teachers

SCI 501 three credits
Teaching Life Science and laboratory Techniques
Prerequisite: MAT enrollment or permission of instructor
Life science concepts and laboratory skills that relate to the instruction of middle and secondary education. Particular emphasis is devoted to the application of infused technology and science in unit development and lesson plans.

SCI 503 three credits
Marine Science for Teachers
Prerequisite: MAT enrollment or permission of instructor
Marine science for teachers, in application to the local environment. This is a classroom/ field-based science course for general science teachers that will link specific learning standards from the Massachusetts State Frameworks to the local environment. Sample MCAS questions from fifth, eighth, and tenth grade science and technology examinations will be analyzed.

SCI 504 three credits
Teaching Middle School Physical Science
Prerequisite: MAT enrollment or permission of instructor
Major science concepts for middle school. This course covers instructional methodology with content-rich material and will link physical science topics and key concepts to specific learning standards and sample MCAS questions.

English

Faculty and Fields of Interest

In scheduling its courses, the English Department recognizes its obligations to its English majors—a group that includes those who intend to go on to graduate study, those who intend to enter the teaching profession, and those who plan careers in such areas as public relations, editorial work, journalism, technical and professional writing, creative writing, personnel work, and the like. The department also recognizes its obligations to non-English majors—those students who elect English courses in order to gain some acquaintance with the rich cultural heritage that English, American, and comparative literature provide, and those who, through advanced courses in writing, wish to improve their powers of communication.

In addition, the department provides a first year English program that includes introductory composition courses (ENL 101, 102), testing and evaluation of writing ability of incoming students, English-as-a-second language instruction, and professional communications courses for the students in business, technology, engineering, and computer science programs.

English majors are offered a choice of three options: the literature option, the writing/communications option and the drama/film studies option, each leading to a Bachelor of Arts degree. These options reflect the department's conviction that perceptive reading, effective writing, and clear thinking are interconnected.

The English department also offers a graduate program leading to a Master of Arts degree in professional writing designed to give students a background in rhetorical and communication theories and the advanced skills necessary for professional jobs in business, government, media, teaching, industry, or publishing.

Jerry Blitefield composition, creative writing

James Bobrick modern poetry, Renaissance literature, children's literature, fantasy

Janet Gardner dramatic literature, computers and literary study

Louise A. Habicht (director of university honors programs) American literature, regional literature, multicultural American literature

Stanley Harrison rhetoric, professional writing, advanced computer applications

Everett H. Hoagland African-American literature, African and West Indian literature, creative writing (poetry)

Catherine Houser literary nonfiction, creative writing (fiction), professional writing

Barbara R. Jacobskind American literature, women's literature

Joan Kellerman ESL, creative writing (poetry), comedy, literature and psychology

John M. Lannon composition, professional writing

Richard J. Larschan medieval literature, 18th-century British literature, satire

James E. Marlow 19th-century British literature, theory of fiction, creative writing (fiction and drama)

William Nelles critical theory, medieval literature

Morgan Peters drama and theater production, video production

Peter Owens journalism, editing, research methods, computers and writing, creative writing (fiction)

Jeannette E. Riley women's literature, feminist theory, American literature

Alan R. Rosen Victorian poetry and poetics, Modern British and American fiction, research methods, scriptwriting

Lulu C. H. Sun rhetoric and composition, English education, English romantic literature

Judy Schaaf 19th century American literature, Medieval English literature, literature of the environment

Edwin J. Thompson (chairperson) comedy, film, post World War II fiction

Linus Travers restoration-18th-century British literature, drama, comic literature, grants writing

John Luther Wallin rhetoric, ethics in professional writing, environmental writing, documentary writing, science journalism

Robert P. Waxler romanticism, Jewish studies, professional writing, communication theory

Charles W. White III American literature, film

English Major
BA degree

To receive a degree with a major in English, students must demonstrate their ability to read intelligently and perceptively in such genres as fiction, poetry, and drama, in works of literary criticism and literary history, and in works dealing with the nature of language itself. Candidates must also demonstrate the ability to write effectively, to use a library efficiently and honestly, to deal critically with generalizations about historical periods and genres, and to handle a variety of critical questions with some maturity.

The English department offers three options within the major: the literature option, the writing/communications option, and the drama/film studies option. Each student selects one of these options.

Writing/communication candidates must demonstrate their ability to analyze rhetorical problems while composing effective, well-formulated documents for specified audiences and to create documents using appropriate computer software.

Students who select the drama/film studies option will master analytical approaches to and historical development of dramatic literature and film as well as their relationship to the development of other genres. In addition, they will learn to create effective written work in the form of reviews, critical essays, and stage or screen plays. Although this option will concentrate on courses in literature and writing, students are encouraged to participate in theater and/or film production and to arrange an appropriate off-campus applied internship.

English Major
Literature Option

		Credits
Requirements		
ENL 300, 302	Survey of British Literature I and II	6
ENL 303	Survey of American Literature I	3
ENL 319	Shakespeare	3
ENL 236	Ancient World to the Renaissance	3
ENL 260*	Intermediate Composition	3
One of the following:	ENL 305, 307, 308, 318, 321	3
Three literature courses at the 300-level		9
One 400-level literature seminar		3
Three additional English courses		9
	Total	**42**

* a prerequisite for any 300-level writing course

English Major
Writing/Communication Option

		Credits
Requirements		
ENL 300, 302	Survey of British Literature I and II	6
ENL 303	Survey of American Literature I	3
ENL 319	Shakespeare	3
ENL 236	Ancient World to the Renaissance	3
ENL 260*	Intermediate Composition (must be taken at UMass Dartmouth)	3
One of the following:	ENL 262, 265, 266, 350, 362	3
ENL 355	Rhetorical Theory **OR**	3
ENL 356	Language and Culture	
One 400-level writing/communications workshop (or approved 600-level graduate writing course)		3
Three additional writing/communications courses, one at the 300-level		9
Two additional English courses, one a literature course		6
	Total	**42**

* a prerequisite for any 300-level writing course

General Education Departmental Requirements

Students majoring in English will meet their departmentally-controlled General Education requirements as follows:

Area E: Select a course from the approved list
Area I, Tier 2: Satisfied by ENL 361, 368, 369
Area W, Tier 2: Satisfied by ENL 260
Area O: Satisfied by ENL 265, 266, 270, 271, 272, 363, or 454

English Major
Drama/Film Studies Option

		Credits
ENL 300, 302	Survey of British Literature I and II	6
ENL 303	Survey of American Literature I	3
ENL 319	Shakespeare	3
ENL 236	Ancient World to the Renaissance	3
ENL 260*	Intermediate Composition (must be taken at UMass Dartmouth)	3
ENL 253 ENL 255	Introduction to Drama **OR** Introduction to Film	3
ENL 321	Golden Ages of Drama	3
One 400-level seminar in dramatic literature or film; or writing workshop in drama or film (or approved 600-level graduate writing course)		3
Two 300-level drama or film courses		6
One creative drama or film course		3
Two additional English courses, at least one at 300 level		6
	Total	**42**

* a prerequisite for any 300-level writing course

English Minor
Literature Option

		Credits
Three of the following: ENL 300, 302, 303, 304, 236		9
ENL 319	Shakespeare	3
Three additional literature courses		9
	Total	**21**

English Minor
Writing/Communication Option

	Credits
Three writing courses (one at the 300-level)	9
One 400-level writing workshop	3
Three literature courses (one at the 300-level)	9
Total	**21**

English Minor
Drama/Film Studies Option

	Credits
Twenty-one credits (7 courses) are required in the following distribution: 3 in intermediate composition, 9 in film, and 9 in drama.	
ENL 253 **or** 255	3
ENL 260* Intermediate Composition (must be taken at UMass Dartmouth)	3
ENL 319 Shakespeare	3
One course in dramatic literature or film literature (e.g., ENL 217, 253, 276, 321, 332, 348, 377)	3
One creative drama or film course (e.g., ENL 269, 378, 453 or possibly a creative drama or film course in a foreign language	3
One 300-level drama or film course **or** ENL 362 (applied drama course may be taken through Experiential Learning or Independent Study)	3
One 400-level seminar in dramatic literature or film literature **or** a 400-level writing workshop in drama or film	3
Total	**21**

* a prerequisite for any 300-level writing course

English Honors Program

Candidates must have completed a minimum of 6 English courses beyond the freshman level and have maintained a minimum GPA of 3.2 in all English courses taken, to be considered for admission to English Honors. Qualified candidates will be admitted upon recommendation of an English department faculty member willing to serve as sponsor.

Requirements
The program involves a closely supervised, two semester (6-credit) investigation into some literary, creative, or rhetorical topic devised by the student in consultation with the faculty sponsor, and requiring a substantial amount of independent reading and research.

The program consists of two separable halves: The first part (ENL 491 or ENL 493) consists of intensive reading and study in the area of the student's proposal, based on the approved bibliography. By the end of semester I, students must (1) present a written proposal for an Honors Project and (2) take a written examination in the area of study—both to be administered and graded by the faculty sponsor. In this way students may receive three credits and a grade even if they decide not to continue in the full program. Based on the outcome of written work to date, the faculty member can assess whether to permit the student to continue: a minimum grade of "B" is required.

In the second semester the student composes the Honors paper (ENL 492 or ENL 494), and a grade is awarded on the basis of this final paper. However, "Honors" will be awarded separately, according to criteria set forth below. (Hence it will be possible to make independent decisions on the awarding of "Honors," or mere credit.)

Criteria and Methods of Evaluation
A three person faculty committee—preferably one of them a specialist in the field under investigation—will judge all written work and administer an oral examination on the subject of the Honors Thesis (Students are entitled to select one of their examiners.) This committee will then award "Honors" or not, on the basis of the following criteria: (1) overall seriousness of purpose; (2) mastery of scholarly or creative methodology; (3) sophistication of insights achieved; (4) ability to relate findings verbally.

Implementation
Each spring the department will inform all junior English majors with the minimum grade point average that they qualify to participate in the Honors Program, and indicate what the program entails. Students will be responsible for selecting their own sponsors. No department member will be expected to direct more than one Honors student per year.

Notes

* Administrative credits do not count towards the total required for graduation.

** English 101 and 102 satisfy the "Tier 1" requirements in Information/Computer Literacy and in Writing Skills.

English Courses

ESL 100 three administrative credits*
Basic English as a Second Language
An introductory review of English language, reading, writing, speaking, and study skills designed for non-native speakers of English. This course requires work in the language lab and the Writing/Reading Center as well as class. The course focuses on ESL readings, idiomatic usage, vocabulary building, grammar review, pronunciation, conversation, listening skills, and composition.

ESL 101 three credits
English as a Second Language
Prerequisite: ESL 100 or by pre-test placement
A writing course for non-native speakers who have developed basic proficiency in English. Students address rhetorical problems using complex syntactical and grammatical structures suitable for abstract thinking and academic discourse. Preparation for ENL 101.

ENL 101 three credits
Critical Writing and Reading I**
Writing in a variety of modes for various purposes and audiences; writing to communicate and to learn in the humanities. Rhetorical choices and revision strategies will be studied. Students will develop skill in critical reading necessary for thinking and writing.

ENL 102 three credits
Critical Writing and Reading II**
Prerequisite: ENL 101
A course designed to advance the rhetorical skills and understanding developed in ENL 101. Critical reading of various literary genres and analytic and argumentative writing assignments enhance the student's awareness and use of effective language.

ENL 200 three credits **C**
Studies in Literature
A study of selected readings dealing with a special topic chosen by the instructor. Recent special topics include New England Literature, Children's Literature, the Artist in Literature, Black Music and Black Literature. May be repeated with change of content. Cross-listed as AAS 200; LST 200.

ENL 201 three credits **C**
Major British Writers
A study of selected works, from several genres, by outstanding British authors.

ENL 202 three credits **C**
Major American Writers
A study of selected works, from several

Gen Ed Note: In English, all literature and creative writing courses satisfy Cultural/Artistic Literacy. Eligible lower division courses are marked **C**, advanced literature courses are eligible as well. Some courses satisfy other requirements, as noted.

genres, by outstanding American authors.

ENL 203 three credits **C, G**
Survey of World Literature I
A study of selected masterpieces from the Golden Age of Greece to the Renaissance.

ENL 204 three credits **C, G**
Survey of World Literature II
A study of selected masterpieces from the Renaissance to the present.

ENL 205 three credits **C, G**
Travel Literature
Prerequisite: ENL 102
Reading and discussion of important works of travel literature from a wide range of periods and genres, with particular emphasis on international and multicultural narratives.

ENL 206 three credits **C**
Detective Fiction
A study of famous mystery, suspense, and detective fiction.

ENL 208 three credits **C**
Myth and Literature
An exploration of the role of myth and dream in poetry, fiction, film, and drama. Heavy emphasis on Jungian and Freudian interpretation of myth, but not to the exclusion of other anthropological, psychological, or theological approaches, through readings in Homer, Ovid, *Beowulf,* Shakespeare, Coleridge, Joyce, and Hesse.

ENL 209 three credits **C**
The Bible as Literature
Readings from the Old and New Testament discussed in the context of the history of ideas, literary genres, the effectiveness of communication to the intended audience, and influences on other literature.

ENL 210 three credits **C**
Literature of the American West
An exploration of the myths and realities of the American West (west of the Mississippi) as they are reflected in literature—e.g., the cowboy, westward expansion, the Spanish conquistadors.

ENL 211 three credits **C**
The American Dream
A study of the meaning of success as reflected in works ranging from those of Benjamin Franklin and Horatio Alger to the plays of Arthur Miller. Cross-listed as LST 211.

ENL 214 three credits **C**
African-American Literature
Chronological survey beginning with Gustavus Vassa and Robert Hayden's "Middle Passage" and continuing through contemporary writers. Toward the end of the course there will be focus on new women writers and major writers through the 1990s. Cross-listed as AAS 214; LST 214; WMS 214.

ENL 215 three credits **C**
West Indian and African Literature
A study of important and innovative West Indian and contemporary African writers. Cross-listed as AAS 215.

ENL 216 three credits **C**
Comedy and Satire
A study of the philosophy and psychology of literary and other forms of comedy and satire, including works by such writers as Aristophanes, Shakespeare, Swift, Voltaire, Wilde, Shaw, Waugh, Heller, Vonnegut, and others, as well as film artists such as Chaplin, Sellers, and Woody Allen.

ENL 217 three credits **C**
Greek Myth and Drama
An exploration of the role of myth in the creation of the plots of Aeschylus, Sophocles, Euripides, and Aristophanes.

ENL 218 three credits **C**
Literature and Society
A study of the relationship between the individual and society through readings in modern literature. Cross-listed as LST 218.

ENL 219 three credits **C**
Classicism and Romanticism
A course contrasting the two major modes of thought in Western Civilization to show what part each has played in the creation of major works of literature, with consideration of analogous examples from music, painting, sculpture, and architecture.

ENL 221 three credits **C**
Special Topics in Comparative Literature
A course dealing with literature of two or more countries, based on a topic selected by the instructor. May be repeated with change of topic.

ENL 223 three credits **C**
Fantasy Literature
A study of fantasy as a genre, comparing other works with Tolkien's *Lord of the Rings* trilogy.

ENL 224 three credits **C**
Jewish Literature
A study of modern Jewish stories and novels with emphasis on such writers as Singer, Bellow, Wiesel, Malamud, and others. Cross-listed as JST 224.

ENL 225 three credits **C**
Native American Literature
Reading, studying, thinking critically, and writing about Native American literature.

ENL 226 three credits **C, D**
Multicultural American Literature
A study of imaginative literature by writers representing the rich variety of racial, ethnic, religious, social, and regional groups in America. Specific focus of the course may vary depending on the instructor.

ENL 227 three credits **C, O**
Semiotics of Culture
Introduces basic theories of communication and models of semiotic analysis. Topics include iconicity, proxemics, kinetics, and the multiple levels of decoding. Readings include analysis of common cultural artifact, verbal and visual media. Students will analyze popular myths and television and print advertising.

ENL 228 three credits **C**
Semiotics of Media
The semiotics of media introduces theories of communication tailored for the verbal arts. Such topics as iconology, iconicity, and hegemonic coding in art style are examined to broaden interpretations of poetry, fiction, film, and theater.

ENL 236 three credits **C, G**
Ancient World to the Renaissance
A study of the origins of English literature embedded in Biblical, Classical, and Medieval sources, with special emphasis on Homer, the Greek dramatists, Virgil, and Dante. Designed to help English majors understand the allusions that enrich English literature.

ENL 245 three credits **C**
Images of Woman in Literature
Study of archetypes and stereotypes of women in literature from the ancient world to the present in an attempt to reevaluate traditional literary criticism and how authors have used images of women to create character, plot, etc. Cross-listed WMS 245.

ENL 246 three credits **C**
Women Writers
Examination of the relationship between the woman writer and her work through a study of literature by and about women. Cross-listed WMS 246 and AAS 246

ENL 250 three credits **C**

Note: ENL 101 and ENL 102 are prerequisites for all 200-level or higher English courses unless otherwise noted.

Introduction to Poetry
A course in the analysis of poetry showing how formalistic and thematic elements in the poem interact to create meaning through an examination of a variety of poetic forms.

ENL 251 three credits **C**
Introduction to the Short Story
A consideration of short fiction to illustrate the history, range, and properties of the genre. The course treats such representative authors as Poe, Hawthorne, Tolstoy, Joyce, Faulkner, and other 19th and 20th century figures from a variety of national literatures.

ENL 252 three credits **C**
Introduction to the Novel
A study of how to read and identify the various types of novels, coupled with an introduction to the history of the novel.

ENL 253 three credits **C**
Introduction to Drama
An introductory course in how to read and view a play, including instruction in the nature and methods of tragedy, comedy, melodrama, tragicomedy.

ENL 254 three credits **C**
Autobiographical Writing
A course emphasizing the development of techniques of lifewriting through exercises in journal-keeping and autobiographical writing. The course includes readings in sample journals and autobiographies and study of autobiographical theory.

ENL 255 three credits **C**
Introduction to Film
Provides beginning students of film with a comprehensive view of its history, aesthetics, and critical terminology. Attention will also be paid to elementary film theory, to a comparison of film with other genres (especially drama and narration), and to representative works of such major figures in the artistic development of the genre as Chaplin, Renoir, Welles, Bergman, Hitchcock, and Kurosawa.

ENL 260 three credits **W**
Intermediate Composition
A course emphasizing the development of skill in organizing materials, the formation of a lively and concrete style and an authentic personal voice, and the growth of useful techniques in the arts of exposition, persuasion, and argumentation.

ENL 262 three credits **W**
Journalism I
An exploration of the principles of journalism as applied in effective news writing and media reporting. Students develop skills in story design and structure, note-taking and story development, accuracy, balance, fairness, style, and writing technique. Legal and ethical issues are explored in detail as students develop and write local stories.

ENL 265 three credits **W, O**
Business Communications
An introduction to the communication skills required in business and industry which emphasizes writing and revising business reports and proposals, letters and memorandums and on preparing and presenting oral reports. Computer applications are included.

ENL 266 three credits **W, O**
Technical Communications
An introduction to the many purposes, audiences, forms, and formats of technical documents and professional correspondence. Students practice writing and editing letters, memos, and reports to achieve worthwhile content, sensible organization, and readable style and learn techniques of audience-and-use analysis to adjust a message's level of technicality to the needs and background of its audience. The course focuses throughout on writing as a deliberate process of deliberate decisions. Computer applications included.

ENL 267 three credits **C**
Creative Writing: Poetry
The study of contemporary techniques in the writing of poetry. Manuscripts are read and discussed in class and during individual conferences. Workshop format.

ENL 268 three credits **C**
Creative Writing: Fiction
Techniques of writing fiction. Manuscripts are read and discussed in class and during individual conferences. Workshop format.

ENL 269 three credits **C**
Creative Writing: Drama
A study of the fundamental principles of dramaturgy. Manuscripts are read and discussed in class and during individual conferences. Workshop format.

ENL 270 three credits **O**
Speech Communication
An introduction to the art of public speaking through the study of effective principles combined with practice in speaking before a group.

ENL 271, 272 three credits each **C, O**
Oral Interpretation of Literature I, II
Study of and practice in the oral interpretation of literary works with heavy emphasis on acting and the Stanislavski method.

ENL 276 three credits **C, G**
Film as Drama
An intensive study of outstanding films with attention to the techniques of film criticism.

ENL 279 three credits **W**
Tutoring Writing: Theory and Methods — Honors
Prerequisites: Honors Program or 3.20 GPA; by nomination and invitation only
The training course designed for the Honors Writing Fellows Program. The course provides students opportunities to learn about on-going theoretical conversations regarding composition instruction, collaborative tutoring, and writing pedagogy. Students learn to use their theoretical knowledge to determine strategies for assisting peers with their written work. Once class hour per week is devoted to application in the Writing Center or in fellowing papers from a class, taping, and analyzing tutorial sessions, and interviewing faculty members about writing in the disciplines.

ENL 293 three credits **C**
Literature of the American South
A study of such Southern writers as Faulkner, Wolfe, Warren, McCullers, O'Connor, Ellison, Ransom, Tate, and Tennessee Williams with the following questions in mind: What was the mood of the South which produced the 20th century renaissance? In what manner are the works related to or dependent on the writers' Southern background? What is the relationship of Southern to American literature?

ENL 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

ENL 299 three credits **C**
Introduction to Shakespeare
A course designed primarily for non-English majors, which examines some of the typical plays of the greatest dramatist in the English

language.

ENL 300 three credits **C**
Survey of British Literature I
A study of British literature from *Beowulf* to 1798, with attention given to the cultural and historical context.

ENL 302 three credits **C**
Survey of British Literature II
A study of British literature from 1798 to the mid-20th Century, with attention given to cultural and historical context.

ENL 303 three credits **C**
Survey of American Literature I
A survey of American writing from the Colonial Period to the Civil War, with emphasis on the historical, cultural, and philosophical developments which parallel the development of an American literature.

ENL 304 three credits **C**
Survey of American Literature II
A continuation of ENL 303. A survey of American writing from the Civil War to the present, with some emphasis on historical, cultural, and philosophical developments in America during the period covered.

ENL 305 three credits **C**
Medieval Literature
Reading and discussion of major works of medieval literature. This course focuses on English literature from *Beowulf* to Malory, but includes translations of key sources and analogues from other literatures.

ENL 307 three credits **C**
The English Renaissance
A chronological overview of the major literary works, themes, and genres of the English Renaissance from Caxton and the inception of printing through Milton and the last of the great Renaissance epics. The course focuses on the development of poetic genres and on representative prose forms. Writers studied include Spenser, Sidney, Shakespeare, Donne, Herbert, Vaughn, and Milton.

ENL 308 three credits **C**
The Enlightenment
A study of English Neo-classical and Pre-romantic writings by Dryden, Swift, Pope, Fielding, Johnson, Boswell, Goldsmith, and others.

ENL 309 three credits **C**
The Romantic Age
A survey of English literature from 1796-1832 stressing the major poets—Blake, Wordsworth, Byron, Shelley, and Keats, with some study of novels and personal essays.

ENL 310 three credits **C**
The Victorian Age
A study of the major English writers of nonfiction from 1832-1900, covering some prose nonfiction (Carlyle, Ruskin, Mill), but emphasizing such poets as Tennyson, Browning, Arnold, Rossetti, Swinburne, Meredith, Hopkins, and Housman.

ENL 311 three credits **C**
The Victorian Novel
A study of the Victorian novel, both historically and generically, from Jane Austen to Thomas Hardy, including works by Austen, the Brontës, Dickens, Thackeray, George Eliot, Trollope, Meredith, and Hardy.

ENL 314 three credits **C**
Colonial American Literature
A study of 17th- and 18th-century American literature from Captain John Smith through Benjamin Franklin with emphasis on the historical background and the various types of literature produced in the period.

ENL 315 three credits **C**
The American Renaissance
A study of selected major writers from mid-19th-century America: Poe, Hawthorne, Melville, Emerson, Thoreau, Whitman, Fuller, and Douglass. Additional readings about the intellectual and social movements of the period are required.

ENL 316 three credits **C**
The 19th Century American Novel
A study of American novelists from Cooper to Crane and Chopin with focus on individual novels as works of art and as examples of the development of the novel form in America in the 19th century.

ENL 317 three credits **C**
19th Century American Poetry
A careful study of the major American poets of the 19th century from Freneau to Whitman and Dickinson.

ENL 318 three credits **C**
Chaucer
Intensive and critical reading of Chaucer's major writings with attention to his cultural context. This course is designed primarily for English majors.

ENL 319 three credits **C**
Shakespeare
A careful reading of Shakespeare's plays selected from the comedies, tragedies, and histories. The course explores Shakespeare's development as a dramatist, the reasons for his reputation as the greatest poet in the language, and the manner in which his plays reflect Elizabethan custom, attitudes, and beliefs. Some outside readings required in Shakespearean criticism and in the background of the period

ENL 321 three credits **C**
The Golden Ages of Drama
Representative plays from the most famous and most productive eras in the history of world drama—Fifth Century B.C. Greece, the Middle Ages, the Renaissance, the age of Molière, and the realistic and romantic drama of 19th century France and Germany

ENL 326 three credits **C**
Studies in Modern Irish Literature and Culture I
Development of Irish literature from the end of the 19th century through the first decades of the 20th century. Writers include Yeats, Joyce, Synge, O'Casey. The course examines the cultural, historical, and political background of Anglo-Irish relations.

ENL 327 three credits **C**
Studies in Modern Irish Literature and Culture II
The drama, fiction, poetry and film created in Ireland since World War II. These works will be studied as a reflection of the profound changes in Irish society, politics and culture, on both sides of the border. Students will explore the reasons for the emergence of an Ireland with a cultural significance out of all proportion to its numbers.

ENL 330 three credits **C**
20th Century British Fiction
A study of the 20th-century British novel, including such authors as Woolf, Joyce, Lawrence, Forster, Huxley, Cary, Spark, Lessing, and Sillitor.

ENL 332 three credits **C**
20th Century British Drama
A study of British drama from the comedy of manners of Wilde and Shaw to the theater of the absurd of Beckett and Pinter.

ENL 333 three credits **C**
Modern British Poetry
A study of the chief trends and the major poets and movements in modern British poetry.

ENL 335 three credits **C**
20th Century American Fiction—1900-1945

Note: ENL 101 and ENL 102 are prerequisites for all 200-level or higher English courses unless otherwise noted.

A study of the 20th-century American novel including Fitzgerald, Hemingway, Faulkner, West, and McCullers.

ENL 336 three credits **C**
20th Century American Fiction—1945 to the present
A study of significant fiction in America since the middle of the 20th century, including Bellow, Ellison, Heller, Pynchon, LeGuin, Doctorow, Morrison, O'Brien, and others.

ENL 337 three credits **C**
20th Century American Poetry
A study of major American poets of this century from Frost to Richard Wilbur.

ENL 338 three credits **C**
Modern Drama
A study of modern dramatists from Ibsen, Chekhov, and Strindberg through such playwrights as Shaw, Brecht, O'Neill, Galsworthy, Eliot, Williams, Miller, Giraudoux, Albee, Pinter, and Ionesco.

ENL 339 three credits **C**
American Drama
A study of American drama from its beginnings to the present.

ENL 340 three credits **C**
Literature and Psychology
An introduction to psychological interpretations of literary works, including character analysis, ethnopoetics, and the psychology of audience. The course requires reading of selected literary texts in all genres, as well as works by psychoanalytical literary critics, philosophers, and anthropologists.

ENL 341 three credits
The Writing of Advertising
Prerequisite: ENL 101, ENL 102
Reviews the semiotic theories of Saussure, Peirce, Jakobson, Barthes and others. Using theories of verbal and visual persuasion, poetic diction and bits of plot, students study techniques of attracting and convincing audiences of radio, print, poster, and television ads. Finally, students will create effective ads.

ENL 345 three credits **C**
Literary Theory
Introduction to key primary documents in the history of literary theory, from Plato and Aristotle through contemporary critical theory.

ENL 346 three credits
Wise Women
Multidisciplinary perspective of the phenomena of women and aging in American society in a team-taught format. The experiences of older women are explored through literature, oral histories, and intergenerational class projects to determine the forces that affect quality of life and productivity in later life. Cross-listed as WMS 346.

ENL 347 three credits **C**
Special Topics in Women's Literature
Advanced study of a specialized topic chosen by the instructor. Cross-listed as WMS 347.

ENL 348 three credits **C, D**
American Women Playwrights
Analysis, evaluation, comparison, and appreciation of plays by 20th-century American women playwrights and insights into their themes and the images of women which they create.

ENL 349 three credits
Teaching English: Classroom Methods
Prerequisite: ENL 260
Theory and practice of teaching secondary English in its three dominant areas of reading, writing, and rhetorical analysis of literary works. Special focus will be upon how students acquire language and theoretical skills within the complex milieu of classrooms and how teachers can enhance that learning by translating sound theory into a broad range of learning activities and classroom strategies. This course is required for certification in secondary English teaching in the Commonwealth of Massachusetts.

ENL 350 three credits **W**
Report and Proposal Writing
Prerequisite: ENL 260
An advanced professional writing course focusing on methods of gathering, analyzing, organizing, and presenting data in graphic, written, and oral forms; on formatting reports and proposals; and on revising and editing for clarity and conciseness.

ENL 352 three credits **W**
Public Relations Writing
Prerequisite: ENL 260
Development of a comprehensive understanding of the principles and purposes of public relations. This writing-intensive course explores rhetorical strategies used by individuals, agencies, corporations, and governments to reach intended audiences. Students gain experience in public speaking and writing press releases, brochures, speeches, and audio-visual press releases.

ENL 355 three credits
Rhetorical Theory
Prerequisite: ENL 260
A study of rhetorical traditions, focusing on major theoreticians from Aristotle to Kenneth Burke. Depending on instructor, the course will concentrate on such topics as Classical rhetoric (from 5th-century B.C. through the English Renaissance), 18th-century rhetoric (Smith, Blair, Whately, Campbell), or contemporary rhetoric (Toulmin, Burke, Richards, Perelman, Kinneavy, Searle).

ENL 356 three credits
Language and Culture
Prerequisite: ENL 260
An examination of language's pivotal role in shaping a culture's values, beliefs, biases, and world view. By reading a broad range of essays, excerpts, and articles, students will learn how language shapes thought, molds perceptions, and determines how we think about and react to various people, groups, and cultures. Students will write a series of articles for lay audiences based on what they learn during the course.

ENL 360 three credits **W**
Advanced Thinking and Writing
Prerequisite: ENL 260
An advanced writing course emphasizing the application of the principles of argument (from ENL 260) to a variety of rhetorical situations. The course covers refinement of notions of persuasive content and logical organization in any discourse, development of a keen sense of style as outlook—of the figures of language and the range of connotation.

ENL 361 three credits **W**
Techniques of Critical Writing
Prerequisite: ENL 260
An advanced critical writing course with emphasis selected by the instructor. The course requires composition of a wide array of essays ranging from critical analyses and reviews to various types of persuasive discourses. Intensive practice in the critical or rhetorical evaluation of selected texts.

ENL 362 three credits **W**
Writing Reviews
Prerequisite: ENL 260
Fosters the ability to write effectively and to communicate the journalist's own interpretation and evaluation of art forms. Students produce reviews suitable for publication on and off campus.

ENL 363 three credits **W, O**
Journalism II
Prerequisite: ENL 260
An exploration of news writing and reporting in selected areas of politics, social services, social science, technology, environment, law, natural science, education, arts, media, business, and other significant media subject areas. The course concentrates on effective research, story design, and writing technique for news stories and features across these areas.

ENL 364 three credits **W**
Feature Story and Article Writing
Prerequisite: ENL 262 or ENL 363
An exploration of the problems and principles of such feature story modes as profiles, how-to articles, narrative adventures, humor, news features, investigative reporting, interpretive and analytic reporting, opinion columns, and editorials.

ENL 365 three credits **W**
The Community and Environmental Reporting
Prerequisite: ENL 260; CHM 130, PHY 162, or BIO 112
Studying and reporting on ways in which communities see themselves and their environments, and ways in which these self-images lead to specific policies and actions. This course focuses on researching and writing and explores the rhetorical situation for the reporter and the treatment meted out to nature.

ENL 366 three credits **C**
Creative Writing: Forms of Fiction
Prerequisite: ENL 268 or permission of instructor
Exploration of the forms of fiction and how a writer's creative choices with regard to form determine characterization, dialogue, plot, and narration. Assignments will include writing various creative pieces. Forms include, but are not limited to, the paragraph, the short short story, the short story, the novella, and the novel.

ENL 368 three credits
Web and Presentation Writing
Prerequisite: ENL 260
Introduction to writing on the Web and for electronic "slide show" presentations frequently used in the business and professional worlds. Students learn basic rhetorical principles involved in composing hyper documents while developing hardware and software skills that apply.

ENL 369 three credits
Desktop Publishing
Prerequisite: ENL 260
Exploration of principles of electronic document design used in professional writing. The course concentrates on desktop publishing, a genre of writing and design devoted primarily to creating paper documents using the computer as the composing shop and printing press. Emphasis is on rhetorical and design skills required in generating professional-quality documents.

ENL 370 three credits **W**
Women, Writing, and the Media
Prerequisite: ENL 260
Studying and writing about issues related to gender, gender-specific language, and the representation of women in various forms of media. The course focuses on discovering, exploring, researching, and writing about women's issues. Cross listed as WMS 370

ENL 372 three credits **W**
Writing About Popular Culture
Prerequisite: ENL 260
Studying, thinking critically, and writing about popular culture and issues arising from it. This course involves exploring, researching and writing about such diverse and interconnected cultural elements as literature, politics, media, religion, science, food, fashion, sports, and the arts.

ENL 373 three credits **C**
World Cinema I: Origin to the New Wave
Prerequisite: ENL 102
A study of the international emergence and evolution of narrative film as a major genre of story-telling, from its origins in late 19th century photographic technology through its maturation in the mid-20th century. Through a combination of readings, film-viewing, and Internet research, students study the impact of technological change on the film medium, the development of film theory and aesthetics, major historical movements like German Expressionism and Italian Neorealism, and the impact of such seminal figures as Griffith, Eisenstein, Renior, Welles, Bergman, Kurosawa, Hitchcock, and Fellini.

ENL 374 three credits **C**
World Cinema II: New Wave to the Present
Prerequisite: ENL 102; ENL 373 recommended, not required
A continuation of ENL 373, focusing on developments in film production, theory, and criticism since 1960. As in ENL 373 course materials include readings, films, and Internet resources. Among the topics are the French New Wave and its influence on European and American film, the emergence of Third World cinemas, post-modern theory and criticism, and the work of important contemporary filmmakers like Godard, Bunuel, Fellini, Tarkovsky, Wertmuller, Wenders, Altman, Scorsese, Nair, Lee, Zhang, Campion, and Tarantino.

ENL 376 three credits
Video Production
Video production: theory, writing and techniques of video production. This course will introduce students to the scriptwriting, theoretical, and scientific readings and practical techniques of video production. Students will examine the theory and acquire training in the range of technical skills of this medium from story board to editing suite: scripting, composition, lighting, sound, camera operation, and video and audio editing.

ENL 377 three credits **C**
Special Topics in Film and Video
Advanced and specialized studies in film (e.g., Shakespeare on Film) or in video production; topic selected by the instructor. May be repeated with change of topic.

ENL 378 three credits
Screenwriting
Prerequisite: ENL 260
An introduction to the principles of dramatic film writing, with emphasis on structure and form from treatment to finished script.

ENL 390 three credits **C**
Advanced Studies in Literature
Advanced and specialized studies in literature (e.g. existential fiction, comparative literature, etc.). Topics will be selected by instructor.

Seminars and Workshops

Seminars and workshops are open only to junior and senior English majors and minors. English majors in the Literature Option must take a literature seminar; English majors and minors in the Writing/Communications Option must take a writing workshop.

ENL 400 three credits
Seminar in American Literature

ENL 401 three credits
Seminar in 19th-Century American Literature

ENL 402 three credits

Seminar in 20th-Century American Literature

ENL 403 three credits
Seminar in an American Author

ENL 410 three credits
Seminar in British Literature before 17th Century

ENL 411 three credits
Seminar in 17th-Century British Literature

ENL 412 three credits
Seminar in 18th-Century British Literature

ENL 413 three credits
Seminar in 19th-Century British Literature

ENL 414 three credits
Seminar in 20th-Century British Literature

ENL 415 three credits
Seminar in a British Author

ENL 421 three credits
Seminar in An American Literature Theme

ENL 422 three credits
Seminar in British Literature Theme

ENL 424 three credits
Seminar in Genre Studies

ENL 425 three credits
Seminar in Comparative Literature

ENL 429 three credits
Seminar in Critical Methods

ENL 430 three credits
Seminar in Bibliography and Research Methods

ENL 450 three credits
Advanced Poetry Workshop

ENL 451 three credits
Advanced Fiction Workshop

ENL 452 three credits
Playwriting Workshop

ENL 453 three credits **W**
Advanced Writing Workshop

ENL 454 three credits **W**
Advanced Journalism Workshop

Honors Courses

The following courses are arranged with permission of the instructor, the department chairperson, and the dean of the college or through the procedures specified for participation in honors work.

ENL 491 three credits
Honors Study: Literature

ENL 492 three credits
Honors Thesis: Literature

ENL 493 three credits
Honors Study: Writing

ENL 494 three credits
Honors Paper: Writing

ENL 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean

Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

ENL 196, 296, 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean

Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Graduate Courses in Professional Writing

ENL 501 three credits
Rhetorical Theory
Aristotle defined rhetoric as "the faculty of discovering all the available means of persuasion in any given situation." W. Ross Winterowd defines it as "the global art that . . . studies the manifestations of all human discourse, not just persuasion." We will study our rhetorical tradition, focusing on major theorists from Aristotle to Foucault. Depending on the instructor, the course may concentrate on such topics as Classical Rhetoric (from the fifth century B.C. through the English Renaissance), Eighteenth Century Rhetoric (Smith, Blair, Whately, Campbell), or Contemporary Rhetoric (Toulmin, Burke, Richards, Perelman, Kinneavy, Searle, Foucault, and Derrida).

ENL 502 three credits
Communication Theories
How does language shape thought? How do human beings communicate? What are the effects of mass communication? The study of communication draws from a range of disciplines including linguistics, semantics, philosophy, psycholinguistics, psychology, psychoneurology, and sociology to derive answers to how humans, as symbol makers, communicate. We will study communication models, mechanistic and transactional analogues, intra- and interpersonal systems, and systems theories. Topics will include: information processing, language as transactional process, communication models, rules of perceptual organization, communication networks, dyadic versus group and mass communication, and nonverbal and interpersonal interactions.

ENL 503 three credits
Language and Its Use
We will study the various grammars and the controversies surrounding them. Attention will be given to the history and growth of language, the artistic language of literature, and the basic vocabulary of language arts (e.g., style, rhetoric, linguistics, semantics, and technical versus artistic language).

ENL 505 three credits
Stylistics
This course explores the analytical and creative possibilities of language. Through both a theoretical discussion and practical application, we will examine how basic elements of writing, such as diction - including figurative language - syntax, structure, and rhetorical style, express and modulate meaning in a variety of writing forms. Students will analyze, create, and critique imaginative pieces, including advertising copy, written speeches, song lyrics, technical articles, short fiction poetry, drama, and literary nonfiction.

ENL 510 three credits
Thesis/Project Research
Principles of research, writing the thesis/project proposal, and initial thesis/project drafting. The course explores primary and secondary research methods. Course content includes in-depth and formal interviewing techniques, principles of field

observation, content analysis, literature reviews, electronic data searches, historical analysis, focus groups, case studies, questionnaire design, use and abuse of statistical inquiry, fundamentals of logic and causation, and philosophical inquiry into qualitative and quantitative research perspectives. The course places major emphasis on how to write a proposal and thesis/project aimed at eventual publication.

ENL 550 three credits
Special Area Study
May be repeated once with change of content.
Prerequisite: Approval of instructor and graduate program director
Under special circumstances, graduate students may take a maximum of two 300-400 level undergraduate courses for graduate credit. Students cannot do "independent study"; they must take a course, and they must arrange with the instructor to do more writing than required of the undergraduates to justify the graduate level credit. This option is not intended for students needing to make up deficiencies in order to perform at an appropriate level in graduate courses, but as an opportunity for students to explore specialized areas of interest. Before registering for this course, students must write a proposal that clearly delineates the writing projects they will undertake.

ENL 600 three credits
Technical and Business Writing
This course introduces students to the many purposes, audiences, forms, and formats of technical documents and professional correspondence. They will receive practice in writing and designing a variety of documents to achieve worthwhile content, sensible organization, and readable style. Focus will be on techniques of audience-and-use analysis to adjust a message's level of technicality to the needs and background of its audience. Focus throughout is on writing as a deliberate process of deliberate decisions.

ENL 601 three credits
Report and Proposal Writing
This course is a case-approach to researching, planning, writing, and revising recommendation reports and proposals to be used by decision-makers. Students will do primary research, on-line bibliographic searches, and learn how to access government documents. They also will learn techniques for writing and designing long reports and proposals for multiple audiences.

ENL 602 three credits
Grants Writing
The course includes intensive research into funding sources, analysis and interpretation of guidelines and writing several drafts of grant proposals. This specialized rhetorical form involves analyzing complex audiences and learning persuasive techniques unique to grants writing.

ENL 604 three credits
Fundraising Rhetoric
Analysis of the several modes of persuasive and descriptive writing used in successful fund-raising: direct mail solicitation, major gift proposals, planned given proposals and documentation, and stewardship. Students will study the ethos of the fund-raising community through a series of actual fund-raising initiatives.

ENL 605 three credits
Persuasive Writing and Speaking
We will survey strategies from Aristotle through Madison Avenue, focusing on ethics and legality and techniques of argumentative discourse: its substance, shape, and style. Emphasis also is on avoiding logical fallacies, composing persuasive messages for clients, customers, colleagues, supervisors, subordinates, and audiences; on writing advertising copy and on giving oral presentations.

ENL 610 three credits
Rhetorical Strategies: Achieving Effective Style
The theory and practice of style as a writer's "way of seeing." By analyzing and emulating outstanding contemporary prose, we develop a style vocabulary, and we explore possible "voices" for expressive, explanatory, or persuasive writing. Reading, writing, and editing assignments focus on the enduring qualities of forceful, readable, and emphatic style: clarity, conciseness, fluency, exactness, and engaging tone, among a wide array of syntactic and semantic elements that help make writing make a difference.

ENL 621 three credits
Editing, Layout, and Document Design
Students will learn about the in-house publishing process, with an emphasis on publications management and automation. Students will coordinate all facets of manuscript production, from automated text editing (or word processing) to automated typesetting and computer graphics. They will work with manuscripts at all production stages: copyediting, galley and page-proof, art development, and indexing.

ENL 623 three credits
Web Authoring
Problems, issues, and rhetorical strategies in authoring effective Web pages and content. The primary focus of the course is in authoring hypertext and hypermedia documents for the World Wide Web. In the process, students grapple with a host of problems related to effective non-linear writing, efficient and user-friendly interface design, and inventive mixing of text, graphics, video, sound, animation, and navigational components to achieve the most dynamic messages possible within the many constraints of hardware and software.

ENL 630 three credits
Teaching Writing: Theory and Practice
Analysis of contemporary composing and rhetorical theories to determine their significance for teaching writing. Strategies for teaching writing will be developed. Topics range from methods for evaluating papers to collaborative learning, to cognitive processes and ways of interacting reading and writing.

ENL 631 three credits
Teaching Technical and Professional Writing
This practicum includes an eclectic survey of theories, tests, and strategies, the supervised teaching of an undergraduate course, and weekly colloquia to assess classroom practice and to share approaches. In addition, each student will complete a related research project (e.g., a comparative analysis of leading textbooks, course structures, or writing needs in local businesses).

ENL 632 three credits
Teaching Reading and Writing: Theory and Practice
Theories on reading and writing and their application to practice in both literature and the composition classrooms. The course covers current pedagogical methods and provides opportunities for students to discuss their own pedagogies and methodologies for teaching.

ENL 640 three credits
Advanced Principles in Journalism and Article Writing
This course examines the limits, techniques, and constraints of investigative journalism. Emphasis will be placed on in-depth reporting in difficult settings, handling of

Note: Undergraduates may be prohibited from taking graduate courses, or access to them may be limited. See the *Graduate Catalogue* for graduate general and program requirements.

controversial material, and story construction of multi-source, highly complex, highly researched articles.

ENL 641 three credits
Technical and Scientific Journalism
This course examines the problems, principles, and techniques of writing effectively in science and technology for both the general public and specialized audiences. Emphasis will be on evaluating technical language and jargon; understanding the needs of various audiences; learning research techniques; and developing interview and validation strategies that help writers clarify trends, theories, patterns, and perspectives. Students will be expected to write articles about newsworthy events for scientific and technical journals.

ENL 642 three credits
Public Relations Techniques
This course offers students a comprehensive understanding of the purposes of public relations, its principles, and the techniques by which its goals are accomplished. The course covers the full range of public relations strategies used by individuals, agencies, corporations, and governments, including press releases, audio-visual presentations, public speaking, paid advertising, lobbying, fostering employee relations, and promoting citizen involvement.

ENL 643 three credits
Arts Reviewing
Prerequisite: Graduate standing in Masters in Professional Writing Program
A journalism course for potential or practicing critics/reviewers. Students will develop their ability to write effectively about and evaluate the visual, written or performing arts. The course stresses both theoretical considerations concerning ethics, rhetorical strategies and persuasive techniques directed at varied audiences (i.e. general circulation publications versus specialty arts publications, alternative press versus mainstream) and the practical preparation of reviews which meet varying editorial requirements.

ENL 645 three credits
Visual Display, Formatting, and Desktop Publishing
This course is designed to expose students to the principles of visual display in working documents so that, as editors and writers, they can work effectively with photographers and artists in the creation of finished texts. Students will explore the use of photos, headlines, graphics, and visual elements as they can be used to enhance the meaning and effectiveness of written text. Students will learn to plan visual elements in the early stages of story, computer program, or document conception. They will explore basic principles of visual design and experience the limitations and problems inherent in generating visual elements. Students will receive practical experience in dummying and layout, and will oversee several projects incorporating visual elements into written works. The purpose of the course is to train writers and editors to be sensitive and effective users of visuals designed primarily by others.

ENL 650 three credits
Topics in Professional Writing
An in-depth writing workshop focusing on various topics in professional writing. The type of writing taught during a particular semester will vary, depending on student interests, faculty research and publication, or the strengths of visiting writers. Possible topics include approaches to writing novels, short stories, screenplays, or poetry; editorial, feature, how-to environmental, and other forms of journalistic writing; freelance writing; and special topics in technical and professional writing.

ENL 659 three credits
Teaching Multicultural Literature: Theory and Practice
Exploration of the study of multicultural literature in light of current thematic and cultural perspectives, including women's literature, minority literature, and third-world literature—especially as such works contrast with or depart from the established canon. The course will examine the influence of these works on student learning and issues that arise in the classroom when they are introduced and will consider options for use of alternative, non-traditional materials. Discussion will focus on the pedagogical limitations, problems, and issues inherent in using a cultural or thematic approach, seeking ways to animate and vitalize the literature classroom.

ENL 660 three credits
Graduate Workshop in Creative Writing I
Fiction, poetry, playwriting, or the essay will be addressed, under the guidance of a published author. Students must demonstrate a talent for performance in one or more of the above genres - either by published works or by a reasonable body of manuscripts completed or in progress. As a class, we will discuss prototypical works, techniques, and the manuscripts of colleagues. A finished piece of work will be required of each student at approximately biweekly intervals.

ENL 661 three credits
Graduate Workshop in Creative Writing II
Special topics, or continuation of ENL 660.

ENL 662 three credits
Graduate Workshop in Literary Nonfiction
This course offers students a comprehensive understanding of the principles and techniques involved in writing literary nonfiction. Students will explore how techniques of fiction are applied to experience and reality to create this modern form of American literature.

ENL 665 three credits
Practicum in Screenwriting
Students will write an original theatrical-length script or one adapted from another media.

ENL 666 three credits
Practicum in Writing for Television: The Pilot Script and the Series
This is a practicum in writing the television series, including the creation of a pilot script and related installments. Students may also elect to work in non-fiction television (e.g., training videos, documentary features and documentary serials). Series may include mini-series.

ENL 667 three credits
Documentary Writing
Documentary Writing enables students to develop and write documentary scripts for film and television, training and industrial films for business, and films for educational organizations, as well as scripts for radio. Technical, artistic, and ethical issues of visual and oral representation will be addressed through practical writing projects.

ENL 690 three credits
Composition Theory
Explores the history and principles of the relatively new discipline of composition studies. The course asks questions: What is the nature of composition studies? What is the history of the discipline? What is the relationship between rhetoric and composition, between theory and practice? What bibliographic resources aid the work of composition specialists? What role do departmental and institutional policies play in shaping/influencing the teaching of

writing? How has pedagogy been influenced by recent developments in rhetorical criticism, cultural studies, feminism, literary theory, language philosophy, and technology? In addition, the course will consider the future of composition studies within the university in areas of instruction such as basic writing, English as a second language, writing across the curriculum, and hypermedia.

Internships

ENL 701-702 three credits each
Internship in Technical Writing
Students will work as writers, editors, or special consultants for organizations or companies producing technical documents, computer programs, or technical memos and reports. Emphasis will be placed on the quality of the student's work and on the problems of collaborating with specialists to produce work for a range of audiences.

ENL 703-704 three credits each
Internship in Journalism
Students will work as writers, editors, or assistants for newspapers, magazines, radio or TV stations, news organizations, or may work in a news writing or editing capacity in public relations. Emphasis will be placed on the quality of published work produced by the student.

ENL 705-706 three credits each
Internship in Creative Writing, Scriptwriting, or Translation
Students will work as writers, editors, or free-lancers for publications, publishers, agents, or under the supervision of the course instructor who will serve as project reviewer. Emphasis will be placed on the quality of writing and the process of marketing manuscripts, scripts, and other creative works.

ENL 707-708 three credits each
Internship in Business and Professional Writing
Students will work as writers, editors, assistants, or special consultants in business, industry, or nonprofit organizations. Writing might include public relations pieces, such as press releases, advertising copy or unsolicited sales letters, and house organs; background papers for managers or executives; and memos, letters, and short reports. Emphasis will be placed on the quality of work produced by the student at the field sites.

ENL 709-710 three credits
Internship in Teaching
Students will work in teaching or teaching-related activities in the field of writing, including tutoring programs or writing centers in public or private schools or special summer programs, under the supervision of an on-site supervisor and the direction of a faculty sponsor who teaches ENL 630, ENL 631, or ENL 632. Emphasis will be placed on the quality of instructional materials produced by the student; programs created, updated, or redesigned; and written report of goals. No student shall receive credit for this course for work done as a teaching or graduate assistant, unless in connection with a project assumed in addition to the regular duties of that position.

Project or Thesis

ENL 750 three credits
Thesis or Project in Professional Writing
First semester. Graded CR/NC (upon approval of completed thesis or project).

Courses Specifically for the Master of Arts in Teaching

ENL 657 three credits
Literature Seminar: Historical Approaches
Explores canonical and/or non-canonical literature from a historical perspective to strengthen background knowledge and understanding of literature, using representative literary texts as a point for departure and discussion. Includes discussion of issues relating the role of historical texts to alternative, non-traditional, and multicultural contexts and of the pedagogical limitations and issues inherent in using a historical approach. Specific focus of the seminar, such as the Dickens Novel, will be listed in the course bulletin and on student transcripts.

ENL 659 three credits
Graduate Literature Seminar: Thematic and Cultural Approaches
Prerequisite: Graduate status or permission of instructor and director
Exploration of the study of literature in light of current thematic and cultural perspectives. This course includes discussion of women's literature, minority literature, and third-world literature, especially as such works contrast with or depart from the traditional canon. The course will examine the influences of these works on student learning and issues that arise in the classroom when they are introduced. In addition to traditional texts, the course will consider the options for use of alternative, non-traditional materials. Discussion will focus on the pedagogical limitations, problems, and issues inherent in using a cultural or thematic approach, with emphasis on finding ways to animate and vitalize the literature classroom.

ENL 676 / FLL 676 three credits
Discourse Processes
Prerequisite: Must be a MAT student
An advanced seminar in exploration of classroom communication with a focus on the means by which language is taught and, specifically, on analyzing and recording instructional conversations involving multicultural populations. The course is intended to provide experience in the investigation of a classroom research question. Students will undertake supervised fieldwork and careful study of the theory and methods of descriptive research from a sociolinguistic perspective.

ENL 684 / FLL 684 three credits
Literary Criticism I: Theory and Practice in Teaching Literature
Prerequisite: MAT enrollment or permission of instructor
Intensive readings with analysis of relationships among language, thought, form, and content. The course will examine the intellectual, emotional, cultural, multicultural, and aesthetic qualities of texts, including the links among stylistic devices, central motifs, author's purpose, motivation, imagination, and psychology with emphasis on secondary students' analytic writing and reading abilities. The course will examine forms of literary criticism as they apply to teaching secondary language and literature.

Foreign Literature and Languages

Majors in French and Spanish
BA degree

The Department offers basic courses in four languages: French, German, Italian, and Spanish, in addition to courses in Latin, linguistics, and language methodology. Students who have demonstrated aptitude and performance in languages may elect a major in French, or Spanish. Minors are also offered in these languages, and in German.

In conjunction with the Boivin Center for French Language and Culture and the College of Business, the Department offers a Certificate in International Business/ French. See the chapter on Interdisciplinary Programs.

In conjunction with the Charlton College of Business and the German universities in the States of Hessen and Baden-Württemberg, the Department participates in the Certificate in International Business with overseas experiences in Germany. See the Charlton College of Business section, below.

Faculty and Fields of Interest

Carlos Benavides Spanish language and literature, linguistics

Joseph A. Bronstad 20th-century German literature and culture

Lewis Kamm 19th- and 20th-century French literature

Deborah Lee 20th-century French literature

Christina Makara-Biron Spanish literature and language, foreign language education

Giulio Massano Spanish and Italian literature of the Middle Ages, Renaissance and Baroque

John H. Twomey (chairperson) 20th-century Spanish and Latin American literature

Mel B. Yoken 19th- and 20th-century French literature, Quebec literature

Requirements

A student who wishes to major in foreign literature and languages—French or Spanish—must complete a minimum of 30 credits in 300- and 400-level courses in the major field. Twenty-seven of these credits must be taken in courses taught in the language of the selected major. In French and Spanish, courses 301 and 302 and six credits in "survey of literature" are required. The remaining hours will be chosen at the discretion of the student with the approval of the advisor. To qualify for any language course at the 300 level, a student must complete courses through 202, or their equivalent in that language. Students wishing to take 400-level courses must normally obtain the consent of the instructor teaching the 400-level course and have earned at least 12 credits in their major at UMass Dartmouth. A grade point average of 2.0 in courses in the chosen language must be attained for graduation.

The Department recommends that all students specializing in foreign literature and languages, especially those planning to teach or pursue a higher degree, take at least 18 hours in a second foreign language.

The Department also strongly recommends that both majors and minors in foreign language seriously consider a study abroad experience. Information and advisement concerning a wide variety of options for study abroad is available from various faculty members in the Department.

Minors in French, German, and Spanish

The minors in French, German, and Spanish may be elected by students majoring in any other field.

Any degree candidate who has between 54 and 84 credits, with a minimum cumulative grade point average of 2.0 and a 2.5 grade point average in his or her major, may request admission to a minor in the Department of Foreign Literature and Languages. Before being admitted to the Foreign Literature and Languages minor, students must obtain permission from the Department Chairperson.

Requirements

Eighteen credits in the one language of the minor are required, and must include:

Both courses 301, 302 (or equivalent)
6 credits in 300 or 400-level courses beyond 301-302.

Practice Teaching

The Department of Foreign Literature and Languages permits students with a 3.0 cumulative average in their major to engage in the University's Teacher Certification Program. Students seeking middle and secondary certification take FLL 322 Introduction to Second Language Acquisition, FLL 326 Discourse Perspectives in Foreign Language Education, and FLL 324 Concepts of Foreign Language Teaching, in addition to the required courses offered by the Education Department. Each semester, a list of names of qualified students will be submitted to the Department of Education. Students should see Professor Christina Makara Biron for advising.

Foreign Literature and Languages Honors Program

Senior majors in the Foreign Literature and Languages Department who have a cumulative average of 3.5 can choose to do honors work. The student must take a three- or six-credit independent study on a specific topic. This course will have an extensive reading list, and the student must present a substantial term paper which will be evaluated by a faculty committee. The term paper must earn at least a grade of A-.

General Education Departmental Requirements

Students majoring in French or Spanish will meet their departmentally-controlled General Education requirements as follows:

Area E:	Students may choose a course from approved list
Area I, Tier 2:	FRN 312, 337, 331, 332, or 411 SPA 302
Area W, Tier 2:	FRN 312, 331, 332, 411, 413, 415, 417, 418, or 420 SPA 304, 312, 314, 331, 332, 333, 334, 445, 446, 455, or 456
Area O:	FRN 312 or 337 SPA 301, 302, or 312

Foreign Literature and Languages Courses

French Courses

FRN 101 three credits
Elementary French I
3 hours lecture, 1 hour laboratory
Essentials of aural-oral, reading and writing usage, with intensive drilling in pronunciation, intonation and grammar

FRN 102 three credits
Elementary French II
Prerequisite: FRN 101 or equivalent
3 hours lecture, 1 hour laboratory
Continuation of FRN 101

FRN 201 three credits
Intermediate French I
Prerequisite: FRN 102 or equivalent
3 hours lecture, 1 hour laboratory
Review of grammar with composition and aural-oral practice. Introduction to French culture and civilization through intensive and extensive reading.

FRN 202 three credits
Intermediate French II
Prerequisite: FRN 201 or equivalent
3 hours lecture, 1 hour laboratory
Continuation of FRN 201.

FRN 203 three credits
French Literature in Translation I
Prerequisite: ENL 102
Outstanding works of French literature in translation. Readings, lectures, and discussions in English.

FRN 204 three credits
French Literature in Translation II
Prerequisite: ENL 102
Continuation of French 203.

FRN 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged Graded CR/NC. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

FRN 301 three credits
French Composition and Conversation I
Prerequisite: FRN 202 or equivalent
Oral and written reports. Practical application of grammar, vocabulary-building and introduction to style.

FRN 302 three credits
French Composition and Conversation II
Prerequisite: FRN 301
Continuation of FRN 301.

FRN 312 three credits
Culture and Civilization of France
Prerequisite: FRN 202 or equivalent
Introduction to the cultural development of the French people throughout history. Lectures, class discussions, written and oral reports on the significant aspects of French literary, social, and artistic life.

FRN 331 three credits
Masterpieces of French Literature I
Prerequisite: FRN 302 or equivalent
The representative authors, poets and dramatists of French literature from *La Chanson de Roland* through the age of Enlightenment will be read and discussed.

FRN 332 three credits
Masterpieces of French Literature II
Prerequisite: FRN 302 or equivalent
The main literary movements from the nineteenth century to the contemporary period will be analyzed. Discussion of literary genres and important aspects of French literary history.

FRN 337 three credits
Commercial French
Prerequisite: FRN 202 or equivalent
An introduction to business in France and Quebec. Topics include business vocabulary, letter writing, transportation, insurance, accounting, labor relations, economic geography.

FRN 411 three credits
La Poésie Française
Prerequisite: FRN 302 or consent of instructor
Elements of French poetry. An examination of versification, melody, rhyme, rhythm harmony, imagery, metaphor, and symbol in representative French poets from the Middle Ages to the present. The course may focus on selected topics and poets. Different instructors may emphasize different periods and works, but at least two centuries will be covered.

FRN 413 three credits
Le Théâtre Français
Prerequisite: FRN 302 or consent of instructor
Elements of French theatre. An examination of such elements as character, time, place, and action in plays representative of French theatre and its evolution. The course may focus on selected playwrights, plays, topics, or themes. Different instructors may emphasize different periods and works, but at least two centuries will be covered.

FRN 415 three credits
La Littérature Québécoise
Prerequisite: FRN 302 or consent of instructor
Aspects of Quebec Literature: the novel, theatre, and poetry. Emphasis will be placed on the distinctive nature of the Quebec literary mind. The course may focus on a single genre or on representative authors.

FRN 417 three credits
Le Roman Français I
Prerequisite: FRN 302 or consent of instructor
Elements of the French novel. An examination of character, vision, and development of the novel focusing on representative works and authors. Different instructors may emphasize different periods and works, but at least two centuries will be covered.

FRN 418 three credits
Le Roman Français II
Prerequisite: FRN 302 or consent of instructor
Similar to FRN 417, but different authors and works will be studied. Thus offering a more complete picture of the scope and range of the French novel.

FRN 420 three credits
Major Currents of French Thought
Prerequisite: FRN 302 or consent of instructor
Examination of influential thinkers from the Renaissance to the present. Possible topics include: Montaigne, Descartes, the Philosophes, Rousseau, Existentialism, Structuralism, Barthes, Lacan and his feminist critics, Derrida, and so forth.

FRN 481 three credits
Seminar in French
Prerequisite: FRN 302 or consent of instructor
An intensive study of a specific topic, such as aural French comprehension, or a particular author or a literary movement. The topic will vary from year to year so that the course may be repeated for credit.

FRN 482 three credits
Seminar in French
Prerequisite: FRN 302 or consent of instructor
Similar to FRN 481 but with a different topic, including history of the French language.

FRN 495 three credits
Independent Study
Prerequisite: Senior standing
Intensive study or research on a special topic under the direction of a staff member. Hours to be arranged.

FRN 196, 296, 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

German Courses

GER 101 three credits
Elementary German I
3 hours lecture, 1 hour laboratory
Introductory study of the language and its grammatical structure. Development of the skills of understanding, speaking, reading, and writing.

GER 102 three credits
Elementary German II
Prerequisite: GER 101 or equivalent
3 hours lecture, 1 hour laboratory
Continuation of GER 101.

GER 103 three credits
Conversational German I
This course is parallel to GER 101, but the emphasis is on learning to understand and speak in everyday situations, particularly in connection with travel and life in Germany today. No previous knowledge of German required.

GER 104 three credits
Conversational German II
Prerequisite: GER 103 or equivalent
Continuation of GER 103 (parallel to GER 102).

GER 201 three credits
Intermediate German I
Prerequisite: GER 102 or equivalent
3 hours lecture, 1 hour laboratory
Review of grammar. Development of facility in composition and conversation. Intensive and extensive reading in texts of cultural and literary value.

GER 202 three credits
Intermediate German II
Prerequisite: GER 201 or equivalent

Gen Ed Note: All Foreign Literature and Languages courses satisfy area **C**, Cultural and Artistic Literacy. They also satisfy other areas as noted.

3 hours lecture, 1 hour laboratory
Continuation of GER 201.

GER 203 three credits
German Literature in Translation
Prerequisite: ENL 102
A survey of German literature from its beginnings through the works of Goethe and Schiller. Lectures, discussion, and reading in English.

GER 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

GER 301 three credits
German Composition and Conversation
Prerequisite: GER 202 or equivalent
Extensive oral and written application of German on the advanced level. The course will be conducted in German with emphasis on idiomatic use of the language and finer points of grammar to give the student greater confidence and accuracy in expression.

GER 311 three credits
German Culture and Civilization
Prerequisite: GER 202 or equivalent
Through reports, readings, and discussions in German, the student will learn about life in Germany, Austria, and Switzerland, both on the contemporary scene and from an historical perspective.

GER 326 three credits
History of the German Language
The historical development of German from its Indo-European origins to the present, its vocabulary, forms, and syntax particularly in their relationship to English. No previous knowledge of German required.

GER 335 three credits
German Poetry
Prerequisite: GER 202 or consent of instructor
A survey of German poetry from the ninth to the twentieth century, with analysis of changing form and content.

GER 357 three credits
German Novelle
Prerequisite: GER 202 or consent of instructor
The short prose form in its development during the nineteenth and twentieth centuries through a reading of representative authors.

GER 366 three credits
Contemporary German Literature
Prerequisite: GER 202 or equivalent
Recent developments in German literature in the Federal Republic of Germany and the German Democratic Republic, as well as in Austria and Switzerland. Material will be presented through reports, readings, and discussions in German.

GER 374 three credits
German Drama
Prerequisite: GER 202 or consent of instructor
German drama from its beginnings to the present day through a reading of representative plays.

GER 481 three credits
Seminar in German
Prerequisite: A 300-level course in German or consent of instructor
An intensive study of a specific topic, such as a particular author or literary movement. The topic will vary from year to year so that the course may be repeated with credit.

GER 495 two to four credits
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

GER 196, 296, 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Italian Courses

ITA 101 three credits
Elementary Italian I
3 hours lecture, 1 hour laboratory
Essentials of aural-oral, reading and writing usage with intensive drilling in pronunciation, intonation, and grammar.

ITA 102 three credits
Elementary Italian II
Prerequisite: ITA 101 or equivalent
3 hours lecture, 1 hour laboratory
Continuation of ITA 101.

ITA 201 three credits
Intermediate Italian I
Prerequisite: ITA 102 or equivalent
3 hours lecture, 1 hour laboratory
Review of grammar with composition and aural-oral practice. Extensive readings of cultural and literary value. Emphasis on practical application of grammar in conversations.

ITA 202 three credits
Intermediate Italian II
Prerequisite: ITA 201 or equivalent
Continuation of ITA 201.

ITA 495 two to four credits
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

ITA 196, 296, 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Latin Courses

LAT 101 three credits
Introductory Latin I
Fundamentals of the Latin language with selected readings, designed especially for those majoring in English or foreign languages. The course seeks to develop a measure of oral ability in the language and knowledge of the phonemics, morphology, and syntax of the declensional and conjugational systems.

LAT 102 three credits
Introductory Latin II
Prerequisite: LAT 201 or equivalent
Continuation of LAT 101.

LAT 201 three credits
Intermediate Latin I
Prerequisite: LAT 102 or equivalent

A third semester of Latin, designed to develop skill in the reading of representative authors of the Golden Age (Catullus, Cicero, Nepos, Horace, Martial, et al.), with additional selections from the Patristic Period (Vulgate) and from the Medieval Period (Isidore of Seville, the Venerable Bede).

LAT 202 three credits
Intermediate Latin II
Prerequisite: LAT 201 or equivalent
A fourth semester course paralleling LAT 201 but with more extensive selections, from Nepos, Horace and Phaedrus (Augustan Period); from the Epistolae of Pliny the Younger, mirroring Roman life, and from the Saturae of Martial; supplemented by other materials where feasible. While one purpose of LAT 201-202 will remain building ability to translate, the courses also aim to foster reading of the Latin texts directly in the original for personal enrichment and satisfaction.

LAT 495 three credits
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

Spanish Courses

SPA 101 three credits
Elementary Spanish I
3 hours lecture, 1 hour laboratory
Essentials of aural-oral, reading and writing with intensive drilling on pronunciation, intonation and grammar.

SPA 102 three credits
Elementary Spanish II
3 hours lecture, 1 hour laboratory
Continuation of SPA 101.

SPA 201 three credits
Intermediate Spanish I
3 hours lecture, 1 hour laboratory
Prerequisite: SPA 102 or equivalent
Review of grammar with composition and aural-oral practice. Introduction to Hispanic Culture and civilization through intensive and extensive reading.

SPA 202 three credits
Intermediate Spanish II
Prerequisite: SPA 201 or equivalent
Continuation of SPA 201.

SPA 203 three credits
Spanish Literature in Translation
Prerequisite: ENL 102
Outstanding works of Spanish literature through the eighteenth century. Readings lectures, and discussions in English.

SPA 207 three credits
Spanish for Law Enforcement Personnel I
Prerequisite: SPA 102 or equivalent; or permission of the instructor
Spanish language to help law enforcement personnel deal with the Spanish speaking community. Individual case studies will be examined in depth in order to facilitate the total involvement of law enforcement personnel in their work. This course is designed principally for students of criminal justice.

SPA 208 three credits
Spanish for Law Enforcement Personnel II
Prerequisite: SPA 207
Continuation of SPA 208.

SPA 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

SPA 301 three credits
Composition and Conversation I
Prerequisite: SPA 202 or equivalent
Oral and written reports. Practical application of grammar, vocabulary-building, and introduction to style.

SPA 302 three credits
Composition and Conversation II
Prerequisite: SPA 301 or equivalent, or permission of instructor
Continuation of SPA 301. Discussion and oral reports based on modern literary works, expository or journalistic prose from Spain and Latin America. Vocabulary-building and frequent compositions.

SPA 304 three credits
Advanced Composition and Conversation
Prerequisite: SPA 302 or consent of instructor
Abundant discussion and oral reports on current themes in the Hispanic world. Frequent compositions on topics found in Spanish, and Spanish-American periodicals and newspapers.

SPA 305 three credits
Business Spanish
Prerequisite: SPA 202
Spanish for correspondence, investments, law, transportation, banking, administration, personnel, publicity and promotion. Abundant practice in translation and vocabulary. Readings and selections from different fields for comprehension.

SPA 312 three credits
Culture and Civilization of Spain
Prerequisite: SPA 302 or consent of instructor
Introduction to the cultural development of the Spanish people throughout their history. Lectures, class discussions, and written and oral reports convey significant aspects of Spanish literary, social and artistic life.

SPA 314 three credits
Culture and Civilization of Latin America
Prerequisite: SPA 301 or consent of instructor
Lectures, class discussions, written and oral reports on the significant aspects of Latin American literary, social, and artistic development from the period of discovery and colonization to present times.

SPA 325 three credits
Advanced Spanish Grammar and Syntax
Prerequisite: SPA 202
A systematic study of Spanish grammar with extensive practice in composition. Recommended for those planning to teach.

SPA 331 three credits
Masterpieces of Spanish Literature I
Prerequisite: SPA 302 or consent of instructor
The representative authors, poets and dramatists of Spanish literature from El Cantar de Mio Cid in the Middle Ages to Quevedo in the Baroque period.

SPA 332 three credits
Masterpieces of Spanish Literature II
Prerequisite: SPA 302 or consent of instructor
Selected plays, novels and poetry from the eighteenth century to the contemporary period.

SPA 333 three credits

Gen Ed Note: All Foreign Literature and Languages courses satisfy area **C**, Cultural and Artistic Literacy. They also satisfy other areas as noted.

Representative Authors of Spanish American Literature I
Prerequisite: SPA 302 or consent of instructor
The main writers from the period of conquest and discovery in the New World to the development of Gaucho literature in the nineteenth century.

SPA 334 three credits
Representative Authors of Spanish American Literature II
Prerequisite: SPA 302 or consent of instructor
The major works from the pre-Modernist period in the nineteenth century to the contemporary period.

SPA 445 three credits
Spanish Poetry and Drama of the Golden Age
Prerequisites: SPA 331, 332; or 333, 334; or consent of instructor
The poetry of the Renaissance and Baroque periods together with the selected plays of Lope de Vega, Calderon de la Barca and Tirso de Molina.

SPA 446 three credits
Spanish Prose of the Golden Age
Prerequisite: SPA 331, 332; or 333, 334; or consent of instructor
The main authors of the sixteenth and seventeenth centuries with emphasis on the life and major works of Miguel de Cervantes.

SPA 455 three credits
Literature of the Nineteenth Century
Prerequisites: SPA 331, 332; or 333, 334; or consent of instructor
The main literary movements, romanticism, realism and naturalism are studied together with the representative works of outstanding authors, poets, and dramatists.

SPA 456 three credits
Contemporary Spanish Literature
Prerequisites: SPA 331, 332; or 333, 334; or consent of instructor
The leading writers of each literary form from the generation of '98 to the present.

SPA 481 three credits
Seminar in Spanish
Prerequisites: SPA 331, 332; or 333, 334; or consent of instructor
An intensive study of a specific topic or topics, such as a particular author, genre, or literary movement. The topic or topics will vary from year to year so that the course may be repeated with credit.

SPA 482 three credits
Seminar in Spanish
Prerequisites: SPA 331, 332; or SPA 333, 334; or consent of instructor
Similar to SPA 481 but with a different topic.

SPA 495 three credits
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Intensive study or research on a special topic in Spanish or Spanish American literature under the direction of a faculty member.

SPA 196, 296, 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Linguistics/Teaching Methods Courses

FLL 211 three credits
Textual Analysis
Literary explication. Intensive readings with analysis of relationships between language and thought and form and content. Training in the writing of analytical critique. Course taught in English.

FLL 250 three credits **C, W**
Language and the Mind
Prerequisite: ENL 102
Examination of language and the relationships among language, thought, and culture by focusing on various human-interest aspects of linguistics. Topics include language of propaganda and politics, language of advertising, language and sexism, euphemisms, jargon, and doublespeak, taboos, doctorese, legalese, bilingualism, social judgments and standard versus non-standard English.

FLL 322 three credits
Introduction to Second Language Acquisition
Factors that affect the production and comprehension of foreign language acquisition, with particular emphasis on acquisition of the Romance Languages. Topics studied include comparisons of second language acquisition with first language acquisition, affective factors, interlanguage, learner strategies, sociocultural factors, and evaluation of proficiency.

FLL 324 three credits
Concepts of Foreign Language Teaching
An analysis of methods and techniques in the teaching and learning of foreign languages. Examination of innovations in foreign language education. A study of the problems of language, subject matter, and materials inherent in bilingual education. Individual and group projects with application of theory to practice.

FLL 326 three credits
Discourse Perspectives in Foreign Language Education
Factors that affect the understanding and production of foreign language texts. An analysis of how meaning is socially and cognitively constructed. Topics studied include the negotiation of meaning, oral vs. written texts, schema theory, ethnography of communication, genre analysis, content language instruction, and evaluation of discourse production and comprehension. An examination of methods and techniques that apply discourse theory to the foreign language classroom.

FLL 425 three credits
Origin and Evolution of Romance Languages
Examination of the common origin of the romance languages in Latin and their evolution into French, Italian, Portuguese, and Spanish. The course uses both the traditional philological method and modern theoretical linguistics, both synchronic and diachronic. Furthermore, linguistic features are interpreted for their historical and sociological factors.

FLL 495 three credits
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

Graduate Courses for the Master of Arts in Teaching

FLL 525 three credits
Origin and Evolution of Romance Languages
Prerequisite: FRN 302, POR 302, or SPA 302 (or equivalent)
Examination of the common origin of the romance languages in Latin and their evolution into French, Italian, Portuguese, and Spanish. The course uses both the traditional philological method and modern theoretical linguistics, both synchronic and diachronic. Furthermore, linguistic features are interpreted for their historical and sociological factors.

FLL 625 three credits
Alternative Assessment and The National Standards in Foreign Language Education
Prerequisite: Must be a MAT student
A critical examination of recent theory and practice concerning the role of assessment in foreign language curricula. The course will emphasize student analysis of current evaluation and assessment models to meet the goals of National Standards and how these models compare with those currently in use in secondary schools within the area.

FLL 676 / ENL 676 three credits
Discourse Processes
Prerequisite: Must be a MAT student
An advanced seminar in exploration of classroom communication with a focus on the means by which language is taught and, specifically, on analyzing and recording instructional conversations involving multicultural populations. The course is intended to provide experience in the investigation of a classroom research question. Students will undertake supervised fieldwork and careful study of the theory and methods of descriptive research from a sociolinguistic perspective.

FLL 684 / ENL 684 three credits
Literary Criticism I: Theory and Practice in Teaching Literature
Prerequisite: MAT enrollment or permission of instructor
Intensive readings with analysis of relationships among language, thought, form, and content. The course will examine the intellectual, emotional, cultural, multicultural, and aesthetic qualities of texts, including the links among stylistic devices, central motifs, author's purpose, motivation, imagination, and psychology with emphasis on secondary students' analytic writing and reading abilities. The course will examine forms of literary criticism as they apply to teaching secondary language and literature.

For the Master of Arts in Teaching program, appropriate 400 level Foreign Language and Literature courses may be offered at the 500 level.

History

History students are offered study in United States, European, Russian, Latin American, African, and Asian history. Students can expect to participate in a variety of academic activities including lecture and discussion courses and seminars. The history curriculum acquaints students with the various methods of historical study, provides them with a broad understanding of the major themes of history, allows them to concentrate on topical courses and themes of their choosing, and offers opportunities to propose and implement their own research projects.

As a broadly based liberal arts degree, the major emphasizes the development of critical thinking and communication skills as well as the acquisition of historical perspective. Graduates prepare themselves for a wide variety of positions in government, education, and business. A B.A. in History can also lead to graduate work in a variety of fields and serve as a sound foundation for law school.

Students with a GPA of 3.2 are eligible for nomination to the University's Alpha Eta Theta Chapter of the International History Honor Society, Phi Alpha Theta.

Faculty and Fields of Interest

Linsun Cheng Asian history

Kevin J. Hargreaves France, European intellectual history, Canada

Veronique Helenon African studies, world history

James A. Hijiya early America, recent U.S., Central America

Gerard M. Koot (chairperson) modern Britain, modern Europe,European economic and social history

Betty L. Mitchell nineteenth-century United States, women's history

Geraldine M. Phipps Russia, Eastern Europe

Benjamin F. Taggie medieval studies

Len Travers American history: colonial, early republic, and New England

Brian Williams Islamic studies, world history

History Minor

Any degree candidate who has at least 54 credits with a cumulative grade point average of 2.0 and at least 2.5 grade point average in his or her major may request admission to the minor in history. This request must be approved by the Department Chairperson. Upon admission students will be assigned an advisor.

Requirements

1
18 credits in history as follows: a) At least 9 credits of 300-400 level courses; b) At least 3 credits in or a seminar; c) No more than 6 credits at the 100 level.

2
A student who maintains a 2.0 average in his/her history courses (for the minor) will have the successful completion of a minor in history noted on his or her transcript.

History Honors Program

The department offers an Honors Program for senior history majors with a 3.2 cumulative average. In this program students write a research paper under the direction of a faculty member of their choice. For details of this program, students should consult their advisors.

Students with a GPA of 3.2 are eligible for nomination to the university's Alpha Eta Theta Chapter of the International History Honor Society, Phi Alpha Theta.

History Major
BA degree

All history majors will be required to take 36 credits in history as indicated in requirements below. Freshmen will normally not take courses above the 100 or 200 level. It is expected that each history major will consult regularly with his or her class advisor in formulating a program of study that will help to fulfill his or her educational and career goals.

Requirements

		Credits
HST 101 HST 102	History of Western Civilization I *and* History of Western Civilization II	6
	OR	
HST 103 HST 104	World Civilizations I *and* World Civilizations II	

30 credit-hours of history courses, to be divided in the following manner:

Six credits in U.S. History (above the 100 level)	6
Six credits in European History (above the 100 level)	6
Six credits in "other" history (e.g., Russia, Latin America, Asia,Near East, Africa, Ancient)	6
Three credits in a history seminar	3
Nine credits of history electives	9
Total	**36**

No more than a total of 12 credits may be taken at the 100 level.

Department General Education Requirements/History

The department has determined the following areas of the General Education requirement for its students:

Area E: Students should select a course from the published list of available courses that satisfy this requirement

Area I, Tier 2: Satisfied by a history seminar, HST 401, 402 or 403

Area W, Tier 2: Satisfied by a history seminar, HST 401, 402 or 403

Area O: Satisfied by a history seminar, HST 401, 402 or 403

History Courses

HST 101 three credits **C, G**
History of Western Civilization I
A survey of the growth of European civilization from ancient times to the end of the Middle Ages, including economic, social, political, and intellectual developments.

HST 102 three credits **C, G**
History of Western Civilization II
Continuation of the study of European civilization from the end of the Middle Ages to the present, emphasizing the origins and development of 20th-century societies and issues.

HST 103 three credits **C, G**
World Civilizations I
Introduces students to historical method and perspective through comparative study of human societies and cultures. The concept of "civilization" is examined in varied contexts through comparisons of social, economic, and political institutions, as well as systems of thought and religion, from pre-history to around 1400.

HST 104 three credits **C, G**
World Civilizations II
A continuation of the study of World Civilizations, from 1400 to the present.

HST 115 three credits **C, D**
History of the United States I
A survey of American history from the beginning to the Civil War. Emphasis on the interactions among people from different races, ethnic groups, sexes, classes, religions, and political persuasions.

HST 116 three credits **C, D**
History of the United States II
A continuation of the survey of American history, from the Civil War and Reconstruction to the present.

HST 160 three credits **C, G**
Slavic Civilization
Survey of the cultural, political, and economic development of Slavic peoples of Eastern Europe and Russia.

HST 180 three credits **C, G**
Asian Civilization
A survey of Asian culture, its origins in Chinese and Indian civilizations, and its subsequent development. Includes the historical, social, and economic development of such newly independent Asian countries as Indonesia, Malaysia, and Singapore.

HST 190 three credits **C, G**
African Civilizations

Gen Ed Key

All History courses satisfy Cultural/Artistic Literacy; lower division courses are marked **C**, but advanced courses are eligible as well. Other courses satisfy other requirements as marked

An introduction to the culture, history, and civilizations of the African continent, with special emphasis on sub-Saharan Africa. This one-semester survey is designed to acquaint the student with the principal themes of African history and development from prehistoric to modern times.

HST 200 three credits **C**
Topics in History
This course will deal with a variety of topics from Russian, European, and American history. One specific topic, e.g. the Russian Revolution, will be taught in any semester.

HST 203 three credits **C, D**
20th Century America I
An interpretive analysis of the major American domestic and foreign policy trends from 1900 to 1945: Progressive Era, World War I, Red Scare, Roaring Twenties, Depression, New Deal, World War II.

HST 204 three credits **C, D**
20th Century America II
An interpretive analysis of the major American domestic and foreign policy trends from 1945 to the present: the Cold War, Fair Deal, McCarthyism, Eisenhower Years, New Frontier, Great Society, Vietnam, Counterculture, Nixon Years, the Me-Decade, the Reagan and Bush presidencies.

HST 205 three credits **C, D**
African-American History I
A survey of the role of African-Americans in American life and culture from the colonial period to the 1890s. Cross-listed as AAS 205 and LST 205.

HST 206 three credits **C, D**
African-American History II
A continuation of the study of the role of African-Americans in American history, from the 1890s to the present. Cross-listed as AAS 206 and LST 206.

HST 207 three credits **C, D**
Women's History in the United States: Colonial to the Present
Survey of the history of women—black and white, native and immigrant, rich and poor—in the U.S. from colonial times to the present. Among the topics to be discussed are: women's role in agrarian vs. industrial society; women and the family; women in the labor movement; female friendships and organizations; the frontier experience; women's suffrage; sex and sex roles; and the birth and growth of the feminist movement. Cross-listed as WMS 207.

HST 209 three credits **C, D**
History of Labor in the United States
History of the American working class throughout the 19th and 20th centuries. The course will examine the experiences of both organized labor and the masses of unorganized workers, and highlight issues of race, class, gender, and ethnicity. Cross-listed as LST 209.

HST 212 three credits **C**
The Case of Lizzie Borden
Using primary source documents such as newspapers, wills, city directories, the federal census, etc., students will study the fascinating case of Lizzie Borden of Fall River who was accused of the brutal axe murder of her father and step-mother. Students will develop their skills in historical methodology, and participation in class discussions is emphasized. Cross-listed as WMS 212.

HST 213 three credits **C, G**
World of the Old Testament
An historical, sociological, and philosophical study of the world of the Old Testament and its effect upon the development of both Christianity and Islam. Special emphasis is placed upon recent archaeological discoveries which shed light upon the interaction of ancient Israel with surrounding cultures and its place in the context of Middle Eastern civilization. Lecture and discussion are supplemented with slide presentations and the display of various artifacts that reflect the lifestyles of the Biblical period. Cross-listed as JST 213.

HST 214 three credits **C, G**
The Post-Biblical World
An historical, sociological, and philosophical study of the post-Biblical world. Particular emphasis is placed upon both the origins of Christianity within the context of Jewish, Middle Eastern, and Roman history and the parallel development of Rabbinic Judaism. In addition to lecture and discussions, the class participates in a Seder Meal where the ritual practices of first-century Israel are recreated. Cross-listed as JST 214.

HST 223 three credits **C, G**
Medieval History
The transition of Europe during the period from the end of the Classical World to the Renaissance. Emphasis on political development, social and economic change, and the role of the Church.

HST 250 three credits **C**
Historiography
Devoted to the study of history as a means to understanding human experience and development. Acquaints the student with source materials, research methods, and problems of interpretation.

HST 260 three credits **C, G**
The History of the Jewish People
A survey of the social, political, and economic history of the Jewish people from the first century through the modern era. Special emphasis is placed upon Jewish-Christian and Jewish-Islamic relations and their effect upon anti-semitism, the Holocaust, and the growth and development of Zionism. The student becomes acquainted with the place of the Jewish people in the mainstream of western culture and with the problem of maintaining ethnic and religious identify in a basically hostile environment.

HST 270 three credits **C, G**
Latin American Civilizations
A comprehensive survey of the pre-Colombian and European-initiated civilizations which developed in regions of the Western Hemisphere colonized by Spain and Portugal. Emphasis is on the independent nations of Latin America from the 1820's to the present. Issues include race and class economic development and dependency, and the legitimation of political authority.

HST 282 three credits **C, G**
China and the Far East
Introduces the history and geography of China, Japan, and Korea. Emphasis on events since the establishment of relations with the West. The interrelations of the three principal Far Eastern states in modern times will be studied.

HST 283 three credits **C, G, D**
Chinese Civilization and Culture
General Chinese history and civilization from ancient times to the present. Emphasis on China's cultural contributions at times of both unity and disunity, and upon the characteristics of cultural change and continuity.

HST 284 three credits **C**
Japanese Civilization and Culture
A study of Japanese cultural and political development from ancient to modern times with emphasis on literature, religion and art.

HST 290 three credits **C, G**
Modern Africa
Survey of Africa's modern history, beginning especially after 1800. It looks at the beginnings and expansions of European and African-American settlements there, the

Zulu and Islamic Revolutions, the conquest and colonization of Africa, and post-colonial developments. Cross-listed as AAS 290

HST 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

HST 300 three credits
Topics in American History
A critical analysis of selected topics or issues in American history which are not otherwise offered in the standard catalogue courses. Cross-listed as AAS 300.

HST 301 three credits **D**
American Colonial History
A survey of the European colonies—especially the Spanish, English, and French—that eventually became part of the United States. Emphasis is on the confrontation of Native-American, European, and African peoples between 1492 and 1763.

HST 302 three credits **D**
History of Religion in America I
A survey of the American religious experience from the seventeenth century to the Civil War, focusing on the redefinition of European religious turmoil in the colonies, Native-American religion, the Great Awakening, eighteenth century Civil millennialism, early growth of Catholicism and Judaism, the communitarian impulse, the explosion of Evangelicalism, the impact on humanitarian reform and the shaping of the African-American religious alternatives.

HST 303 three credits **D**
History of Religion in America II
A survey of the American religious experience from the Civil War to the present, focusing on the rise of Black churches, the impact of immigration and urban industrialism, the Ghost Dance religions, the Social Gospel, the Americanization of the Catholic Church, the Fundamentalist controversy, the impact of the Depression, Neo-Orthodoxy, the public religion of the Cold War, Pan-Indianism, twentieth century Judaism, the flowering of the cults, and the emergence of the electronic churches.

HST 304 three credits **D**
History of North American Indians
Survey of the history of Indians of North America from their origins to the present. The course will examine a variety of native peoples in different regions of the continent, but mostly in what is now the United States, and the interaction between those native peoples and newcomers from Europe and Africa.

HST 305 three credits **D**
The United States in the Age of Revolution
A study of the period from 1760s to the 1840s, concentrating on the development of political ideas and practices. Topics will include the Revolution, its origins and consequences; the Constitution; the rise of political parties; Jeffersonian and Jacksonian democracy; and territorial expansion.

HST 306 three credits **D**
Civil War and Reconstruction
The antebellum, Civil War, and Reconstruction period of American history. This was a crucial era because so many fundamental issues were at stake: the place of African-Americans in American society; the destiny of Southern whites who tried to save their slave regime by seceding from the Union; and, the very survival of the United States as a nation.

HST 307 three credits **D**
Plymouth Colony 1620-1692
Explores the history of the colony of New Plymouth, with an emphasis on the interaction of the colonists with the native people of Southeastern Massachusetts. Students analyze primary sources as well as recent historical works to understand the relation between American myth and American history.

HST 310 three credits **D**
America's Working Women
The experience of American working women—black and white, native and immigrant, organized and unorganized—from the colonial period to the present day. Because work is defined as productive labor, this course will examine women as paid and unpaid workers—in the marketplace as well as in the home. Some of the areas of study will be women on the frontier, women in the mills and factories, labor union women, women in the professions, and the history and politics of housework. Cross-listed as LST 310 and WMS 310.

HST 311 three credits
New England Maritime History
The relationship between New England and the sea. This course is more local in its approach than the American Maritime History course, and treats coastal and foreign trade of individual ports, whaling, fishing, and recreational industries. The decline of maritime New England is also treated, bringing the course into the most recent decades.

HST 313 three credits
Territorial Expansion of the United States
Examines the geographic, economic, social, and diplomatic issues involved in the settlement and development of the nation from the earliest European outposts to the passing of the frontier and the shift to overseas territories. In tracing the internal expansion of the United States, attention will be focused upon the exclusion of the native Americans from the mainstream of American life.

HST 314 three credits **D**
History of Urban America
The emergence and development of the American city from the seventeenth century to the present, stressing the colonial town, cities and the new nation, immigration and the nativist reaction, slavery in the city, the completion of the urban network, the political machine, the urban reformer, the company town, the African-American migration to the city and the emergence of the metropolis.

HST 315 three credits
History of Massachusetts
The development of the state from its Colonial beginnings, through its transformation into an industrial society during the nineteenth century and its twentieth century adaptation to industrial and technological changes. This will not be simply a political history but will include geography, industrial history, social and transportational as well as immigration studies. There will be a discussion of the broadest variety of topics possible.

HST 317 three credits **G, D**
History of European Women
A survey of women's history from the Renaissance to the present that critically examines the recent scholarship on this topic. The course will deal both with remarkable and ordinary women. Extensive use will be made of recent research on the history of the family and social demography as well as the more traditional areas of

Gen Ed Key

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political, intellectual, and economic history. While emphasizing Western Europe, the course will include some material from the Americas and other areas. Cross-listed as WMS 317.

HST 318 three credits
Women's Biography and Autobiography
Examines the lives of various women in the United States, Great Britain, and elsewhere both from a literary and historical perspective. Examples of women whose lives will be studied are Charlotte Bronte, Sarah and Angelina Grimke, and Charlotte Perkins Gilman. Cross-listed as WMS 318.

HST 319 three credits **G**
Early Modern Europe 1600 to 1815
A survey of post-Renaissance European civilization to the 19th century. Emphasis on the growth of the modern state system, the origins of capitalist economies, the scientific revolution and Enlightenment, and the political history of the principal monarchies.

HST 321 three credits **G**
17th and 18th Century European Intellectual History
A survey of the intellectual history of Europe in the early modern period, including the growth of skepticism and the secularization of thought, the scientific revolution, the Enlightenment and the creation of a liberal climate of opinion, and the origins of modern political and economic theory.

HST 322 three credits **G**
19th and 20th Century European Intellectual History
An examination of such intellectual currents as romanticism, liberalism and conservatism, nationalism, socialism and capitalism, and social Darwinism. Attention will be paid to the development and maturation of these currents in the 19th century, and their modification in the 20th century.

HST 323 three credits **G**
Europe in the 19th Century
The major political, economic, intellectual and social developments in Europe from the French Revolution to the outbreak of World War I.

HST 324 three credits **G**
Europe in the 20th Century
A study of the forces shaping contemporary Europe. Attention will be paid to World War I and its impact, the Versailles settlement, liberalism and democracy in the 20th century, the challenge of totalitarian systems, the Second World War, the Cold War, West European unification, and disintegration of the Eastern Bloc.

HST 325 three credits **G**
European Overseas Expansion 1500 to 1800
Examines European mastery of the oceans from the beginning of long-distance trade with Africa to colonization and empire-building in Asia and the Americas. Emphasis on the competing interests of states and the building of a world system.

HST 327 three credits
Topics in the History of Ideas
Treats the history of ideas as an interdisciplinary approach to both intellectual history and the history of European society. Topics will vary with the instructor.

HST 329 three credits **G**
European Economic History
An analysis of economic growth, economic policy and social change in Europe from the medieval period to the present, including a discussion of the contemporary European economy.

HST 331 three credits **G**
The Renaissance
A survey of political, economic, and cultural developments in Europe from 1300 to 1500 with special emphasis on Italy.

HST 332 three credits **G**
The Reformation
A survey of the background of the Reformation, the religious changes of the period, the role of reformers such as Luther, Calvin and Zwingli, and the effects of reform between 1500 and 1648.

HST 333 three credits **G**
History of the British Isles to 1485
A survey of the history of the English, Irish, and Scottish peoples of the British Isles from the earliest times to 1485. Topics include Celtic, Roman, Anglo-Saxon and Viking Britain; the development of the medieval monarchy; and medieval culture and society.

HST 334 three credits **G**
History of the British Isles from 1485 to 1800
A survey of the history of the English, Irish, and Scottish peoples of the British Isles from the end of the medieval period to 1800. Topics include the Tudor, Stuart and Hanoverian monarchies; the Reformation and Civil War; society and culture; the British Empire; and the strengthening of English, Irish, and Scottish identities.

HST 335 three credits **G**
History of the British Isles from 1800 to the Present
A survey of the history of the English, Irish, and Scottish peoples of the British Isles from the early Victorians to the present. Topics include the expansion and decline of the British Empire, the famine and conflict in Ireland, the coming of democracy, the creation of the first industrial economy and society, the movement for women's rights, British participation in two world wars, and contemporary issues.

HST 337 three credits **G**
English Constitutional History
Prerequisites: HST 333, 334.
A survey of the legal and constitutional development of England from the Anglo-Saxon settlement to the Reform Bill of 1832. Attention to documents and other contemporary materials (in English). Recommended for pre-law students.

HST 339 three credits **G**
Canada to 1867
3 hours lecture
Survey of Canadian history from European contact to the year of confederation. Lectures and readings integrate themes in the political, social, economic and military history of native, French, and British populations, with emphasis on the development of the early maritimes and Quebec.

HST 340 three credits **G**
Canada Since 1867
Extending the survey of Canadian history from Confederation to the present, this course focuses on the political history of post-colonial Canada, with social, economic and cultural issues introduced to illuminate the problem of nation-building for a population divided by regional and ethnic differences. Special attention will be paid to Quebec and the Maritimes, native-Canadians, U.S. relations, and contemporary constitutional issues. HST 339 is recommended, but not required as a prerequisite.

HST 341 three credits **G**
France to 1789
A survey of French history in the 17th and 18th centuries. Topics include the rise of the Bourbon monarchy, the reign of Louis XIV, the growth of religious and political dissent, the struggle for European hegemony and overseas empire, the cultural influence of France in the Enlightenment, and the crisis of the old regime.

HST 343 three credits **G**
History of Greek Civilization
An introduction to the history of Greek civilization, from Minoan and Mycenaean times to the Hellenistic period. Emphasis will be on cultural and intellectual developments in their social and political contexts.

HST 344 three credits **G**
History of Roman Civilization
A survey of Roman civilization from the origins of Rome to the age of Constantine, emphasizing Roman social and political institutions. Related topics include Roman imperialism, Latin literature, Roman religion, and early Christianity. Readings include a variety of primary sources.

HST 347 three credits **G**
History of Italy in the 19th Century
A detailed study of the Risorgimento, or movement for Italian unification. Attention will be given to economic and cultural life as well as political events.

HST 348 three credits **G**
History of Italy in the 20th Century
An analysis of the rise and fall of Italian fascism, including a study of Italy's participation in both World Wars.

HST 351 three credits **G**
History of Germany to 1786
A study of the development of the Germanic states from the founding of the First Reich in the 10th century to the death of Frederick the Great. Topics to be considered include: the development and nature of the medieval empire, the conflict with the Papacy; the Reformation; the Counter-Reformation; the spread of absolutism; the development of Prussia; and the role of the Hapsburgs in German affairs.

HST 352 three credits **G**
History of Germany from 1786 to the Present
A history of Germany in the modern era with the emphasis on politics and culture. Detailed treatment of 19th century unification and the rise and fall of Fascism.

HST 355 three credits **E, G**
Anti-Semitism and Its Ethical Issues
Explores the issues of moral choice and ethical responsibility inherent in the history of the Jews in Biblical times, the patristic period, Middle Ages, Reformation, Enlightenment, French Revolution, nineteenth-century Europe and the United States, the Holocaust, up to the present day.

HST 356 three credits **G**
The Holocaust
An examination of the Holocaust, including the psychosocial aspects of prejudice; the history of Jew hatred from Biblical times; the historical, political, racist, economic, social, psychological, literary, legal, theological, and moral aspects of the Holocaust. Cross-listed as JST 356.

HST 357 three credits **G**
Empires of Central Asia, From Attila the Hun to the Taliban
Survey of the cultures and ethnic groups of Islamic Central Asia (Afghanistan, Uzbekistan, Kazakhstan, etc.) from the Middle Ages to the 21st Century. Provides an introduction to Islam and the various empires of Central Asia such as the state of Attila the Hun, Arab Empire, Mongol Khanates, Soviet Union and Taliban in Afghanistan.

HST 358 three credits **G**
Ethnicity and Conflict in the Lands of the Ottoman Empire
Political and cultural survey of the Islamic Ottoman Empire in the Middle East, North Africa, and Balkans which commences with the Arab and Turkish conquests during the Middle Ages. An underlying theme for this course will be understanding the historic roots of nationalism and recent ethnic conflict in former Ottoman lands such as Bosnia, Kosovo, Turkey, Macedonia, and Palestine.

HST 360 three credits **G**
The United States in the 1960s
An examination of the United States from the 1950s to the 1970s. Topics to be considered include the black freedom struggle, Vietnam, the New Left, the women's movement, gay liberation, and the counter culture.

HST 361 three credits **G**
Russia to 1855
Survey of Russia from the 9th Century to 1855. Stress will be given to political, social, and economic developments.

HST 362 three credits **G**
Russia in Reform and Revolt, 1855 to 1918
Survey of Russia from 1855 to 1918. Emphasis will be on the great reforms, political and economic changes, the rise of revolutionary movements, the Revolution of 1905, and the Revolution of 1917.

HST 363 three credits **G**
History of the Soviet Union
Study of Russia from 1918 to the present. Stress will be given to the establishment of the Communist government, the Five Year Plans, and the social and cultural changes resulting from the adoption of Soviet ideology. Attention will be given to the role of Russia in the modern world.

HST 364 three credits **G**
Social and Cultural History of Russia
Topics pertaining to social classes, the development of serfdom, religion, and art and literature in Russia from the 9th Century to the present. Cross-listed as WMS 364.

HST 365 three credits **G**
Eastern European History
The study of the Eastern European bloc from the Middle Ages to the present. Emphasis will be given to the political and economic development of these countries and the establishments of Communism in the post-World War II period.

HST 366 three credits **G**
Topics in the History of Soviet Foreign Policy
Topics relating to the principles underlying Soviet foreign policy and to different countries and areas where the Soviet government has conducted foreign policy: for example, the United States, Western Europe, the Third World, China. Not every topic will be taught each time the course is given.

HST 370 three credits **G**
Portugal and Spain in the Middle Ages
Medieval antecedents of modern Portugal and Spain. Students examine the political, cultural, and economic contributions of the Romans, Visigoths, and Moors. Particular attention is given to the dominance of Castile-Leon, which emerged as modern Spain and the seminal factors that led to an independent Portugal.

HST 371 three credits **G**
History of Portugal
A survey from the Roman era to the present with emphasis on the post-medieval period. Topics include the emergence of a unified state, dynastic rivalries, the economy, overseas expansion and empire, constitutional development, the "New State" of Salazar, the revolution of 1974, and post-revolutionary Portugal.

HST 372 three credits **G**
Latin American-United States Relations

Surveys the long history of contacts between Anglo and Latin America, with fullest emphasis on the era of the national states and the evolution of the inter-American system. Economic, cultural, and political aspects of the relationship will be studied, up to the present.

HST 376 three credits **G**
History of Brazil
Emphasis on the period since independence in 1822. Topics include the empire and slavery, coffee, European immigration, the republic, race and class, foreign economic and ideological influences, and Brazil in the 1980s.

HST 378 three credits **D, G**
Slavery in the New World
The trans-Atlantic slave trade and slavery in the Americas from the sixteenth to the nineteenth century. Emphasis on the beginning and development of the trans-Atlantic slave trade; moral issues, economics, and tactics of the trade; and comparisons of the slave societies of Brazil, the Caribbean, and the United States. Cross-listed as AAS 378 and LST 378.

HST 381 three credits **G**
Modern Japan
A survey of modern Japan since the 19th Century, with emphasis on post-war Japanese politics and Japan's present role in world affairs.

HST 382 three credits **G**
Modern China
A study of the major themes of modern Chinese history, including culturalism and nationalism, responses to the impact of the West, and the development of revolutionary ideology.

HST 385 three credits **G**
History of the People's Republic of China
A study of the world's most populous country. Covers the rise and fall of Nationalist China, the establishment of the People's Republic, social transformation, economic policy, bureaucracy, and freedom, Mao's ideology, the people's communes, the cultural revolution, the new leadership, and the new U.S./China relationship.

HST 391 three credits **G**
Topics in African History
Prerequisites: HST 190 or HST 290 or written permission of the instructor
Advanced-level course for students with a background in African history. Topics vary from year to year. Research papers are required. Cross-listed as AAS 391 and LST 391.

HST 395 three credits **G, W**
World Religions and Spirituality
Comparative and historical perspectives on world religions and humanity's search for meaning. Focuses on various cultural responses to "ultimate concerns" about the purpose of existence, creation, the supernatural, eternity, soul or spirit, death, suffering, good and evil, enlightenment, and salvation. Encompasses varied forms of religion and spiritual expression from highly structured and defined systems to folkways and mysticism.

HST 399 three credits
Teaching History and Social Science in Middle and Secondary Schools
Prerequisites: EDU 207, 327
The historical and contemporary debate on the nature of the history and social studies curriculum in middle and secondary schools. This course will investigate the actual curriculum and practice of history and social studies teaching in area schools, and formulate specific strategies for effective teaching and curriculum building.

HST 401 three credits
Seminar in American History
Seminars will be offered variously in topics in American History. The writing of a substantial paper will be required. Content will vary with instructor; may be repeated with change of content. Cross-listed for AAS, JST, and WMS when the content is appropriate.

Recent offerings include:

HST 401 three credits
Seminar: Plymouth Colony

HST 401 three credits
Seminar: Civil War Biography

HST 401 three credits
Seminar: U.S. Women's History

HST 401 three credits
Seminar: America in the 1960s

HST 402 three credits **G**
Seminar in European History
Seminars will be offered variously in topics in American History. The writing of a substantial paper will be required. Content will vary with instructor; may be repeated with change of content. Cross-listed for JST and WMS when the content is appropriate.

Recent offerings include:

HST 402 three credits **G**
Seminar: British Industrial Revolution

HST 403 three credits **G**
Seminar in World History
Seminars will be offered variously in topics in non-European World History. The writing of a substantial paper will be required. Content will vary with instructor; may be repeated with change of content. Cross-listed for AAS, JST, and WMS when the content is appropriate.

Recent offerings include:

HST 403 three credits **G**
Seminar: Russian Revolutionary Thought

HST 403 three credits **G, W**
Seminar: Latin America

HST 403 three credits **G**
Seminar: Modern China

HST 404 three credits **G**
Honors Seminar in American History
Honors version of HST 401.

HST 405 three credits **G**
Honors Seminar in European History
Honors version of HST 402.

HST 406 three credits **G**
Honors Seminar in World History
Honors version of HST 403.

HST 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

HST 196, 296, 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged

HST 499 six credits
Honors Research Paper
The writing of an honors research paper. Students may elect to take three credits one semester and three in another.

Courses for the Master of Arts in Teaching

Some undergraduate senior-level courses are offered to graduate students under a corresponding 5xx number, with concurrent enrollment but additional work expectations.

HST 501 three credits
Theory and Practice of Teaching History and Social Science in Middle and Secondary Schools
Prerequisite: Must possess an initial teaching license or hold a MAT degree in History or Social Science
See HST 399.

HST 511 three credits
Teaching American History
Prerequisite: Graduate student status or special permission of instructor
Seminar examining current trends and issues in the study of American history. Intended primarily for MAT candidates in history and social studies, this course will focus on recent developments in scholarship and their implications for the teaching of American history.

HST 512 three credits
Teaching European History
The content and methodology of European history courses in secondary schools. Participants will study recent scholarship on major historical topics in European history and organize materials and design strategies to integrate this scholarship in the curriculum.

HST 513 three credits
Teaching World History
The content and methodology of world history courses in secondary schools. Participants will study recent scholarship and consider new interpretations of major historical issues in world history. They will then organize materials and design strategies to integrate these perspectives and scholarship into the curriculum.

HST 521 three credits
Graduate Seminar in History
Graduate Seminars in history are designed to allow participants to pursue reading and research on a particular historical topic. Course may be repeated with change of topic.

Humanities/Social Sciences

Humanities/Social Sciences Major
BA degree

Program Director, Lewis Kamm
Professor of Foreign Literature
and Languages

The Bachelor of Arts in Humanities/Social Sciences offers students the opportunity to gain a broad-based understanding of human activities, institutions, and societies and to develop their ability to think and write critically all in the classical tradition of the liberal arts. The program prepares students for a wide variety of careers in human services, the professions, and the corporate world. It is especially recommended for those intending to become elementary teachers. Given its broad academic scope, it provides the foundation for long-term career development and change.

The interdisciplinary nature of the Humanities/Social Sciences major makes it especially important that students work closely with their faculty advisor in selecting courses and constructing a coherent academic program. Within the major, students select a field of concentration, which can also form the basis for a minor in a department or topical area such as Women's Studies, Labor Studies, African/African American Studies, Gerontology, etc.

Students are encouraged to declare the Humanities/Social Sciences major as soon as possible in their academic career, at which time they should submit a written rationale and proposed program of study to the Dean of the College of Arts and Sciences and their faculty advisor. The major is also available to entering freshmen who plan to seek certification as elementary teachers. BA degree candidates may not use it as part of a double major.

Requirements

The major consists of 36 credits of Humanities/Social Sciences courses, at least 24 credits of which must be at the 300-level or above. Up to 12 credits may be taken at the 200-level. No 100-level course may be used to satisfy major requirements. Courses used for the major may also be used to satisfy the requirements of a minor or parts of the University's General Education program, but *not* the distribution requirements of the College of Arts and Sciences.

A
Distribution of courses in the major.

Within the 36 credits of the Humanities/Social Sciences major the following distribution must be followed:

1
Students choose at least two areas (disciplines) in the Humanities and at least two in the Social Sciences (four areas total--see lists of disciplines under 4).
2
At least 6 credits (two courses) must be taken in each of the four areas selected.
3
Area of concentration. A minimum of 12 credits, including a 400-level course, must be taken in one of the four areas selected.
4
The remaining 6 credits of the major may be taken in any of the ten Humanities/Social Sciences areas or disciplines.

Humanities Disciplines
- Art History
- English
- Foreign Literature and Languages
- History
- Music (non-applied courses)
- Philosophy
- Portuguese

Social Sciences Disciplines
- Economics
- Political Science
- Psychology
- Sociology/Anthropology

B
College distribution requirements.

Humanities/Social Sciences majors must satisfy the College of Arts and Sciences distribution requirements for BA candidates. Courses used to satisfy the college distribution requirements and H/SS major requirements may also be used to satisfy the University's General Education requirements.

C
University General Education Program.

All majors in the University are required to complete the General Education requirements. Several of the General Education categories are automatically satisfied by the College distribution requirements (categories C, S, and Tier 1 of categories I and W). Students normally satisfy categories E, G, and D in the course of meeting distribution and major requirements. The Tier 2 requirements in Information and Computer Literacy, Writing Skills, and Oral Skills are normally met within the department of concentration. Since the H/SS major is interdisciplinary, students will normally use the department of concentration to meet these requirements. In any case, students should discuss their General Education options with their major advisor.

Mathematics

Mathematics can be pursued as a scholarly discipline of an especially elegant kind—a creative art form—or it can be treated as a valuable tool in an applied discipline.

The program for mathematics majors is designed to provide a solid foundation in the theoretical and applied aspects of mathematics necessary for a variety of professional careers. The flexibility within the third and fourth years was established to enable mathematics majors to concentrate in areas of their interest. The Computer-Oriented Mathematics Program (COMP) is designed for those seeking positions in industry or with the government. The program emphasizes applied and computer mathematics. Students can choose their curricula so as to emphasize that role of mathematics which will be useful to them in later years. For example, students may use our offerings as preparation for

- secondary school teaching;
- graduate school in mathematics, applied mathematics, or computer science;
- a career in applied mathematics in either the public or private sector; and
- graduate school in an area that uses mathematics, such as economics, biology or psychology.

Some mathematics majors have had success in law school, pharmaceutical school, and medical school.

The Department offers both a major and a minor program.

Faculty and Fields of Interest

Louis G. Bianco probability, statistics

Maria Brekka mathematics education

Nurit Budinsky nonlinear differential equations, numerical analysis, nonlinear dynamical systems

Richard Faulkenberry linear algebra

Dana Fine applied math, relativity theory

Sigal Gottlieb applied mathematics, scientific computing, parallel computing

Ivona Grzegorczyk (on leave) algebraic geometry, mathematics education

Adam O. Hausknecht algebra, analysis of algorithms

Stephen Hegedus mathematics education

James J. Kaput algebra, math education and the philosophy of mathematics

Saeja Oh Kim modern algebra

Robert E. Kowalczyk probability, numerical analysis, computer applications

Steven J. Leon numerical analysis, linear algebra

Gary Martin logic

Robert McCabe analysis

Despina Stylianou mathematics education

Ronald Tannenwald (chairperson) dynamical systems

Mathematics Major
BA degree

Requirements
Regular Option

At the end of the sophomore year, students, aided by their faculty advisors, should plan a course of study for the completion of the college program.

The advanced courses selected during the third and fourth years should be consistent with the students' interests and goals.

Students must earn a grade of C- or higher in all mathematics courses taken at the 200 or higher level in all undergraduate mathematics degree programs.

		Semester Credits First	Second
First Year			
MTH 111, 112	Analytic Geometry and Calculus I & II	4	4
CIS 180	Object-Oriented Programming **OR**	3	
CIS 260	Computer Programming Fortran		
ENL 101, 102	Critical Writing and Reading I, II	3	3
	Humanities, Social Science or Free Electives	3	6
MTH 181, 182	Discrete Structures	3	3
		16	**16**
Second Year			
MTH 211	Analytic Geometry and Calculus III	4	
MTH 212	Differential Equations		3
MTH 221	Linear Algebra	3	
PHY 113, 114	Classical Physics	4	4
	Literature	3	3
	Humanities, Social Science or Free Electives	3	6
		17	**16**
Third Year			
MTH 311	Advanced Calculus I	3	
MTH 312	Advanced Calculus II		3
	Mathematics Electives	3	3
	Humanities or Social Sciences	3	3
	Unspecified Electives	6	6
		15	**15**
Fourth Year			
MTH 441	Modern Algebra	3	
	Mathematics Electives	3	3
	Humanities or Social Science	3	3
	Unspecified Electives	4	6
		13	**12**
	Total credits:		**120**

Mathematics Major
BS degree

Students may elect to earn a Bachelor of Science degree provided that they complete certain requirements for the BA degree and also take an additional six credits of Natural Science (but only courses that the science departments themselves would credit to a major in their areas). The humanities/social science requirements for the BS degree are a combined total of eighteen credits. At least six must be taken from each area.

Mathematics Electives

		code*
MTH 302	Theory of Numbers	T
MTH 310	Modern Methods in Mathematics Teaching	T
MTH 311, 312	Advanced Calculus I, II	T, G, A
MTH 321, 322	Topics in Applied Math I, II	A, G
MTH 331	Probability	A, G
MTH 332	Mathematical Statistics	A, G
MTH 353	Applied Linear Algebra	A
MTH 361, 362	Numerical Analysis I, II	A, G
MTH 381	Combinatorial Theory	A, G
MTH 382	Graph Theory	A,G
MTH 421	Complex Variables	A, G
MTH 441, 442	Modern Algebra I, II	A, G
MTH 443	Applied Modern Algebra	A, G
MTH 451	Differential Geometry	G
MTH 452	Higher Geometry	G, T
MTH 461	Elementary Topology	G
MTH 463	Math Models	A
MTH 487	Math Inquiry I	T, G
MTH 488	Math Inquiry II	T, G
MTH 499	Selected Topics in Math	T, G

*** Code**
T—recommended for students preparing to teach
G—recommended for students preparing for graduate school
A—recommended for students in applied mathematics

Mathematics Major: Computer-Oriented Mathematics Option

BS degree

In order to meet the needs of our present-day computer-oriented society, the Mathematics Department presently offers an alternative to the mathematics major program of study—a computer-oriented mathematics program leading to the BS degree in Mathematics. This program requires a core of computer science courses and emphasizes the applied mathematics areas more than the mathematics program. This program allows the student a large choice of electives within the context of computer-oriented mathematics. The student can thus pursue his or her special interests in any particular phase of computer-oriented mathematics.

The program has virtually the same freshman and sophomore years as the other programs in mathematics, computer and information science, computer engineering and electrical engineering. This allows a student to find his or her interests and make a final choice from among these before the end of the second year without any loss of time.

A BS degree in Computer-Oriented Mathematics allows the student to enter graduate programs that specialize in computer-oriented mathematics or enter industrial employment where physical and industrial problems are analyzed mathematically.

The program offers a large choice of electives within the context of computer-oriented mathematics. The student can thus pursue his or her special interests in any particular phase of computer-oriented mathematics.

See requirements on next page.

Requirements

Computer-Oriented Option

		Semester Credits First	Semester Credits Second
First Year			
MTH 111, 112	Analytical Geometry and Calculus I, II	4	4
CIS 180	Object-Oriented Programming	3	
CIS 181	Programming Paradigms		3
ENL 101, 102	Critical Writing and Reading I, II	3	3
	Humanities/Social Science Electives	3	3
MTH 181, 182	Discrete Structures I, II	3	3
		16	**16**
Second Year			
CIS 260	Computer Programming—FORTRAN	1	
MTH 211	Analytical Geometry and Calculus III	4	
MTH 212	Differential Equations		3
CIS 265	Program Design and Data Structures with C	3	
PHY 113, 114	Classical Physics I, II	4	4
	Humanities/Social Science Electives	3	6
MTH 221	Linear Algebra		3
		15	**16**
Third Year			
MTH 321, 322	Topics in Applied Math I, II	3	3
MTH 331	Probability	3	
MTH 332	Mathematical Statistics		3
	Science Electives*	3	3
	Free Electives	3	3
	Literature	3	3
		15	**15**
Fourth Year			
MTH 361, 362	Numerical Analysis I, II	3	3
	Humanities/Social Science Elective	3	
	Technical Electives**	3	3
	Free Electives	6	4
MTH 353	Applied Linear Algebra		3
		15	**13**
	Total credits:		**121**

*
The Science Elective is defined as any course in Biology, Chemistry, Physics, or Medical Laboratory Science which is accepted for credit by majors in those programs.

**
The Technical Elective is defined as any upper-division Mathematics or Computer and Information Science course.

General Education Departmental Requirements

Students majoring in Mathematics will meet their departmentally-controlled General Education requirements as follows:

Area E: Students may choose a course from the approved list
Area I, Tier 2: TBD
Area W, Tier 2: Students may choose a course from the approved list
Area O: TBD

Mathematics Minor

The minor in mathematics comprises a central core of required courses followed by opportunities for advanced work and some specialization. Any student of the university is eligible for the designation "Minor in Mathematics" upon completion of the following requirements. Each course for the minor must be completed with a grade of C- or better, and the student must maintain at least a C average (2.0 GPA) in the minor program.

Requirements

		Credits
MTH 111	Analytic Geometry and Calculus I	4
MTH 112	Analytic Geometry and Calculus II	4
MTH 211	Analytic Geometry and Calculus III	4

At least one of the following courses:

MTH 212	Differential Equations	3
MTH 221	Linear Algebra	
MTH 227	Linear Algebra for Applied Science	

At least three additional three-credit courses, numbered 300 or higher.	9
Total	**24**

Mathematics Courses

MTH 100 three administrative credits *
Basic Algebra
An introductory level algebra course intended primarily for those with weak or no skills or those who have been away from the subject for some time. This course provides the algebra background required for all entry level courses in mathematics

MTH 101 three credits **M**
Elements of College Mathematics I
MTH 101, 102 comprise a terminal course of study for students whose curriculum calls for one year of mathematics. MTH 101 is also a prerequisite for MTH 231. The first semester covers selected topics from algebra, set theory, matrix algebra, and elementary functions.

MTH 102 three credits **M**
Elements of College Mathematics II
Prerequisite: MTH 101 or MTH 103
Introduction to differential and integral calculus.

MTH 103 three credits **M**
Finite Mathematics
Will cover selected topics from Logic, Set Theory, Vectors and Matrices, Linear Programming, Probability, Graphs and Theory of Games. May be taken in lieu of MTH 101.

MTH 104 three credits **M**
Fundamentals of Statistics
The mathematical techniques involved in organizing data, averages and variation, elementary probability theory, the binomial distribution, normal distributions and related topics, estimation, hypothesis testing, regression and correlation, Chi Square- tests of independence, Chi Square- goodness of fit and analysis of variance: comparing several sample means.

MTH 105 three credits
Technical Calculus I
First semester of a four-term calculus sequence required of technology students and recommended for non-physical science majors desiring a basic introduction to analysis. The first term will review those topics from algebra and trigonometry needed in the sequel. Then the basic concepts of the differential calculus will be studied.

MTH 106 three credits
Technical Calculus II
Prerequisite: MTH 105
Continuation of MTH 105. Further study of algebraic and transcendental functions of one variable and topics from the integral calculus of these functions

MTH 107 three credits **M**
Elements of College Mathematics Enhanced
Elements of college mathematics in application to business, selected to emphasize interpretation and explanation and to de-emphasize computation

MTH 108 three credits **M**
Modern Math for Elementary Teachers
Problems of the changing modern mathematics curriculum. Current issues, attitudes, and learning theories will be studied, including the mathematical foundations of the elementary school curriculum.

MTH 109 two credits
Mathematical Problem Solving and Reasoning I
Basic mathematical problem solving and reasoning skills development. The course uses an intensive hands-on, problem-centered approach to develop mathematical thinking skills, frequently using computer software and group work. The course begins with simple thinking skills and mathematical ideas, and "what to do when you're stuck" strategies. The goal is to develop strategies for solving hard problems and understanding complex or abstract ideas.

MTH 110 three credits **M**
Mathematical Problem Solving and Reasoning II
Continuation of MTH 109.

MTH 111 four credits
Analytic Geometry and Calculus I
Prerequisite: Trigonometry
First semester of a four term sequence required of majors in mathematics, the physical sciences and engineering. Recommended for others desiring a thorough background in elementary analysis. Term 1 will cover topics in analytic geometry, the concepts of function and limit, continuity, differentiability and integrability of elementary algebraic and transcendental functions. Techniques of differentiation and applications will then be studied.

* Administrative credits do not count towards the total credits required for graduation.

Gen Ed note: Mathematics courses satisfy the Mathematics requirement. Those marked **M** below are appropriate for non-science/engineering majors.

MTH 112 four credits
Analytic Geometry and Calculus II
Prerequisite: MTH 111
Continuation of MTH 111. Topics from the integral calculus, stressing techniques of integration (including numerical methods). Infinite series.

MTH 113 four credits
Calculus for Applied Science and Engineering I
Prerequisite: Trigonometry
Corequisites: PHY 111, EGR 107
Functions, limits, differentiation and integration of elementary algebraic and transcendental functions. Vectors, vector operations, vector fields and line integrals will be introduced. Technological tools an a computer algebra system will be used extensively throughout the course.This course, a version of MTH 111 for the integrated freshman year curriculum in engineering, may be repeated as MTH 111.

MTH 114 four credits
Calculus for Applied Science and Engineering II
Prerequisite: MTH 113 or MTH 111
Corequisites: PHY 112, EGR 108
Continuation of MTH 113 or MTH 111. Techniques of integration, improper integrals, applications of integrals, series, polar coordinates and an introduction to differential equations. Selected topics from multivariable calculus will include partial differentiation, double and triple integrals, line integrals and flux.This course, a version of MTH 112 for the integrated freshman year curriculum in engineering, may be repeated as MTH 112.

MTH 117 three credits **M**
Fractals and Chaos via Elementary Mathematics
Prerequisite: Above average score on the MTH 101 placement test
The new science of chaos revealed through its fascinating history and stimulating examples. The connection will be demonstrated between such seemingly unrelated topics as weather and stock prediction, management and scientific decisions, the erratic motion of a pendulum and the delicate design of snowflakes, clouds, or the fjords of Sweden. Students will create their own fractals and play the chaos game using computer software, calculators, or even just pencil and paper.

MTH 118 three credits **M**
Mathematics for Artists
Prerequisite: satisfactory score on mathematics placement exam
Relationships between fine art and mathematics, with an emphasis on understanding geometric patterns and concepts. Topics include art-related examples and hands-on experiences which give basic mathematical background for future artistic students' endeavors.

MTH 119 three credits **M**
Math and Music
Prerequisite: minimal ability to read music
Topics which emphasize and explore the close connection between mathematics and music. Historical connections will be studied, as well as the mathematics behind acoustics, rhythm, and 20th century music, and mathematical theories of randomness, leading to fractal music and fractal noise. The mathematical structures behind non-Western musical theories such as pentatonic and quarter-tone scalings, and polyrhythms will be explored.

MTH 120 three credits **M**
Quantitative Reasoning
Prerequisite: Satisfactory score on mathematics placement exam
Fundamentals of quantitative literacy including inductive-deductive reasoning, paradoxes, and problem-solving strategies. Numeracy including estimation, scaling, uncertainty, and infinity will be discussed. Rate of change, linear and exponential models will be explored. Applications of quantitative reasoning to the social sciences will be emphasized.

MTH 127 three credits **M**
Evolution of Mathematics As the Language of Nature
Prerequisite: above average score on MTH 101 placement test; or permission of instructor
Eratosthenes measured the earth without encircling it more than two thousand years ago. Elementary mathematics will be used to rediscover Eratosthenes and other human giants' methods in measuring the distance from Earth to the moon, the sun or other heavenly stars, to find out the precise orbit of Mars, and to prove that the planets (including Earth) do accelerate towards the sun. Philosophy and the foundation of principles in science will be discussed, such as quantitative verses, qualitative principles, and the discovery that Nature is written in the language of mathematics.

MTH 131 three credits **M**
Pre-calculus
This course is designed to provide students with the precalculus background necessary for MTH 111 or MTH 105. The course covers topics in algebra, trigonometry and finite mathematics.

MTH 181/182 three credits each
Introduction to Discrete Structures I, II
Review of set algebra including mappings and relations, algebraic structures including semigroups and groups. Elements of the theory of directed and undirected graphs. Boolean algebra and propositional logic. Applications of these structures to various areas of computers.

MTH 203 three credits
Technical Calculus III
Prerequisite: MTH 106
Continuation of MTH 106. Topics include conic sections, polar coordinates, functions of two variables, partial differentiation, multiple integration and infinite series.

MTH 204 three credits
Elementary Differential Equations
Prerequisite: MTH 203
Techniques in the solutions of ordinary differential equations, and applications from engineering. Similar to MTH 212 with less emphasis on theory and more on applications. The natural continuation of MTH 203.

MTH 211 four credits
Analytic Geometry and Calculus III
Prerequisite: MTH 112
Continuation of MTH 112. Two and three dimensional vectors, partial differentiation, multiple integrals and applications.

MTH 212 three credits
Differential Equations I
Prerequisite: MTH 112
Continuation of MTH 211. Ordinary differential equations of the first order, linear differential equations of the nth order, some nonlinear second order equations, series solutions and Laplace transforms.

MTH 213 four credits
Calculus for Applied Science and Engineering III
Prerequisite: MTH 114
Continuation of MTH 114. An introduction to multivariable and vector calculus. The course covers multivariable functions, partial differentiation, multiple integrals, parameterized curves and surfaces, vector fields, line integrals, flux and divergence. This course, a version of MTH 211 for the integrated freshman year curriculum in engineering, may be repeated as MTH 211.

MTH 221 three credits
Linear Algebra
Prerequisite: MTH 111
Required of all second-year mathematics majors and recommended for students in the physical, natural, behavioral and management sciences. Course material includes systems of linear equations, matrix theory, vector spaces, linear transformations, Eigenvalues.

MTH 227 three credits
Linear Algebra for Applied Sciences
Prerequisite MTH 111
A first course in linear algebra covering general theory of matrices and linear systems. Topics include: Matrices and linear systems, determinants, vector spaces , orthogonality, and eigenvalues. Computer laboratory exercises included.

MTH 231 three credits
Elementary Statistics I
Prerequisite: MTH 101 or equivalent
Fundamental business statistics. The text, examples, and applications are all business-oriented. The first-semester topics include descriptive statistics, probability, estimation, statistical inference and sampling.

MTH 232 three credits
Elementary Statistics II
Prerequisite: MTH 231
Continuation of MTH 231. Regression and correlation analysis. Analysis of variance. Goodness-of-fit tests. An introduction to Bayesian decision methods.

MTH 233 three credits
Elementary Applied Statistics (Honors)
Prerequisites: College Algebra and at least a score of 570 on Math SAT, or permission of the instructor
Topics in descriptive and inferential statistics including summary measures, discrete probability, normal density functions, point and interval estimation, hypothesis testing procedures, t-tests, analysis of variance, chi-square tests, correlation, and regression analysis. A statistical computer software package will be extensively utilized. Condensing the topics covered in MTH 231 and 232, this course satisfies the MTH 231/2 requirement of most business-related majors

MTH 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

MTH 302 three credits
Theory of Numbers
A study of the integers, divisibility properties, diophantine equations, congruences, quadratic residues, Pythagorean triangles and selected higher topics.

MTH 310 three credits
Modern Methods in Mathematics Teaching
Prerequisite: mathematics major
The use of techniques and materials in teaching the mathematical sciences in grades 8-12. Special attention will be given to new information technology and its use in enhancing learning and problem-solving abilities. This course will concentrate on the integration of commercially-available computer software into the mathematics curriculum in algebra, geometry, statistics, and precalculus, as well as with more traditional materials. This course is for mathematics majors intending to teach.

MTH 311 three credits
Advanced Calculus I
Prerequisite: MTH 212
This course is a rigorous analysis of the concept of limits, continuity, the derivative and other selected areas.

MTH 312 three credits
Advanced Calculus II
Prerequisite: MTH 311
Continuation of MTH 311 with emphasis on uniform convergence and related topics.

MTH 321 three credits
Topics in Applied Mathematics I
Prerequisite: MTH 212
A study of Fourier Series and Integrals, Fourier and Laplace Transforms, Partial Differential Equations.

MTH 322 three credits
Topics in Applied Mathematics II
Prerequisite: MTH 321
Continuation of MTH 321. The course covers Besel functions and Legendre polynomials; calculus of variations, vector analysis.

MTH 331 three credits
Probability
Prerequisite: MTH 112
A calculus-based introduction to statistics. This course covers probability and combinatorial problems, discrete and continuous random variables and various distributions including the binomial, Poisson, hypergeometric normal, gamma and chi-square. Moment generating functions, transformation and sampling distributions are studied

MTH 332 three credits
Mathematical Statistics
Prerequisite: MTH 331
Continuation of MTH 331. Classical estimation methods and hypothesis testing are studied. This course also covers Chi square tests for goodness-of-fit and independence, regression and correlation analysis, and one-way and two-way analysis of variance including factorial designs and tests for the separation of means.

MTH 353 three credits
Applied Linear Algebra
Prerequisites: MTH 221, CIS 261
Orthogonality and least square problems. Other topics include applications of eigenvalue, quadratic forms, Numerical Linear Algebra.

MTH 361 three credits
Numerical Analysis I
Prerequisites: MTH 221, 212, CIS 261, (MTH 221 may be taken concurrently)
Theory and computer-oriented practice in obtaining numerical solutions of various problems. Topics include stability and conditioning, nonlinear equations, systems of linear equations, interpolation and approximation theory.

MTH 362 three credits
Numerical Analysis II
Prerequisite: MTH 361
Numerical methods for solving initial value problems. Topics include: numerical differentiation and integration, Euler method and Taylor's series method, Runge-Kutta methods, multi-step methods, and stiff equations.

MTH 381 three credits
Combinatorial Theory
Prerequisites: MTH 111, 112, 181, 182, 221
Techniques of counting: elementary enumerative methods, generating functions, partitions, recurrence relations, inclusion-exclusion principle, the Polya theory of counting, generalizations of the pigeonhole principle and selected topics from experimental design and coding theory.

MTH 382 three credits
Graph Theory
Prerequisites: MTH 111, 112, 181, 182, 221
A study of graph theory and its applications. Topics included are Hamiltonian and Eulerian properties, matching, trees, connectivity, coloring problems, and planarity. Emphasis will be on applications including optimization of graphs and networks.

MTH 421 three credits
Complex Analysis
Prerequisite: MTH 211
Analytic functions, differentiation, integration, conformal mapping, calculus of residues and infinite series.

MTH 441 three credits
Modern Algebra I
Prerequisite: MTH 221
The study of relations, functions, groups, rings and fields.

MTH 442 three credits
Modern Algebra II
Prerequisites: MTH 221, 441
This course deals primarily with the following: Sylow theorems, polynomials, field extensions and Galois theory.

MTH 451 three credits
Differential Geometry
Prerequisite: MTH 312
Analysis of curves and surfaces. Frenet-Serret formulae. First and second fundamental forms for surfaces, Gaussian and mean curvature, theorems of Meusnier and Rodriques, and the Gauss-Bonnet theorem are also studied.

MTH 452 three credits
Introduction to Higher Geometry
Prerequisite: MTH 211
A survey of the history of geometry, emphasizing the scholars of antiquity. Topics from modern (college) geometry, projective and non-Euclidean geometries.

MTH 461 three credits
Elementary Topology
Prerequisite: MTH 312
An introduction to point-set and combinatorial topology.

MTH 463 three credits
Math Modeling
Selected topics from the areas of linear programming, dynamic programming, Markov chains and game theory. Mathematical model building will be developed through the use of numerous case studies from the natural and social sciences, e.g., ecological models, network models, scheduling models, urban structure, traffic flow, growth, etc.

MTH 464 three credits
Simulations
Deterministic and nondeterministic simulation. Random number generators, Monte Carlo techniques, discrete simulation techniques and simulation computer languages (e.g., GPSS, SIMSCRIPT) are studied. Standard Simulations Models, such as the national economy model, inventory control, banking, blackjack, etc., will also be covered.

MTH 487 three credits
Mathematical Inquiry I
Prerequisite: MTH 212
Course is conducted as a seminar. An elementary question is posed to the students who must generate their own mathematics in an attempt to find a solution. The aim is to develop student independence and creativity.

MTH 488 three credits
Mathematical Inquiry II
Prerequisite: MTH 212
A second semester of inquiry, independent of the first.

MTH 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

MTH 196, 296, 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

MTH 499 three credits
Selected Topics in Mathematics
Prerequisites: MTH 212 and permission of department
A special course to meet the needs of students for material not encountered in other courses. Topics dealt with require the approval of the departmental chairperson.

Graduate Courses in Mathematics and Mathematics Education

MAE 507 three credits
Probability for Teachers
Prerequisite: Permission of instructor or undergraduate algebra
Probability for Teachers is an introduction to the discrete probability theory in an experimental hands-on way. The stress is put on pedagogical contents, including common misconceptions and misunderstandings in probability. The course also examines the modern educational technology and software used in probability.

MAE 508 three credits
Statistics for Teachers
Prerequisite: Permission of instructor or MAE 507
Statistics for Teachers surveys the statistical methods used in science and everyday life and addresses the problem of pedagogy and statistical misconceptions. The course also examines the modern educational technology and software used in statistics.

MAE 511 three credits
Calculus and Analysis for Teachers
Prerequisite: Permission of instructor or undergraduate calculus
Calculus and Analysis for Teachers assumes successful completion of a standard university calculus sequence. It addresses the key underlying idea of the mathematics change: notions of variation, rate, mean value, and accumulation across many contexts and representations, as well as the connections between rates and accumulation as embodied in the Fundamental Theorem of Calculus. It also addresses relations between discrete and continuous models of change, including conceptions of limit.

MAE 520 three credits
Discrete Math for Teachers
Prerequisite: Permission of instructor or modern algebra
Topics in Discrete Mathematics, including combinatorics, logic and set theory, algorithms, linear algebra, relations and functions, elements of number theory, and chaos/fractals. The focus will be on the connections and deep structural themes unifying these areas, and on using discrete math to gain a deeper understanding of high-school algebra and calculus.

MAE 521 three credits
Geometry for Teachers
Prerequisite: Permission of instructor or

undergraduate geometry
Geometry for Teachers surveys the new types of geometry made possible by dynamic computer graphics as well as topics that help students deepen their understanding of the key ideas of Euclidean geometry. The course also examines the forms and purposes of proof, and student development of spatial and logical reasoning.

MAE 522 three credits
Algebraic Structures for Teachers
Prerequisite: Permission of instructor or undergraduate algebra
Algebraic Structures for Teachers examines the many forms of algebraic reasoning and their conceptual underpinnings, the fundamental shift in the place of algebra in school mathematics, and the potential unifying role of abstract and general algebraic structures at the upper secondary level. The course will engage students in vigorous critique of traditional and innovative algebra learning materials and technologies.

MAE 530 three credits
Technology in Mathematics Education
Prerequisite: MTH 211 or enrollment in MAT program
Relevant contemporary mathematics investigated through new innovative technologies in an inquiry-based classroom. Explores non-Euclidean geometries, stereographic projection, and the complex plane using dynamic geometry environments, nonlinear dynamical systems using Chaotic Waterwheels, and parametric variation using new hardware infrastructures, as well as multi-dimensional mathematics using graphing software and haptic technology.

MAE 540 three credits
Mathematical Challenges
Developing understanding of student mathematical learning and needs through the completion of mathematical challenges. Each week a new challenge will be set with hints offered at various times. Each challenge will not have a straightforward solution, and the class is expected to develop personal insights into the nature of their mathematical behavior and relate these reflections to practice. An email discussion list and website will facilitate continued inquiry and sharing of ideas outside of class.

MAE 591/2 three credits
Topics in Mathematics for Teachers
Prerequisite: Permission of instructor
Individual and/ or group study under supervision of a faculty member in an area of mathematics for teachers that is not otherwise part of graduate course offerings.

Medical Laboratory Science

In medical laboratory science, both the clinical laboratory science option and the cytotechnology option, provide students with the concepts, professional attitudes, scientific theory and skills essential for practicing clinical laboratorians. Medical laboratory science leads students to understand the health care delivery system and the role of the clinical laboratory scientist and cytotechnologist in that system, to function as professionals, and to gain the skills and attitudes needed to enter their practice. All graduates are eligible for national certification and licensure.

Students use state-of-the-art equipment and laboratory methods in the new, modern-design laboratory facility. The medical laboratory science faculty are professional laboratory scientists and leaders in local, regional, and national professional and scientific organizations who influence the practice of the profession by serving on committees and as consultants.

Faculty and Fields of Interest

Dorothy A. Bergeron immunohematology, health education, professional issues

Brenda Bouchard coagulation, serology, science education

Lynne Brodeur medical laboratory science

Eileen Carreiro-Lewandowski clinical chemistry, biochemistry, laboratory regulation

James T. Griffith (chairperson) microbiology, antimicrobial agents, health legislation

Susan J. Leclair hematology, health planning

Frank J. Scarano molecular epidemiology, clinical microbiology

Medical Laboratory Science Major

BS degree

Entrance to Medical Laboratory Science
In addition to the general course requirements for admission, the Department of Medical Laboratory Science more specifically requires 3 units of Natural Science and 3 units of College Preparatory Mathematics which must include 2 units of algebra.

Admission of Transfer Students and Certified Clinical Laboratory Technicians
Credits earned at another institution will be evaluated for transferability and equivalency to existing UMass Dartmouth courses. All required Medical Laboratory Science courses must be taken at the University of Massachusetts at Dartmouth, unless approved by the department.

Health Policies
Students admitted to medical laboratory science programs are expected to have a complete physical examination and the appropriate immunizations as outlined by the department. For each item listed below students must show evidence of vaccination and documentation of history of disease.

- Hepatitis B vaccine
- Tetanus/diphtheria
- Measles/mumps/rubella
- Polio
- Varicella (chicken pox)
- Mantoux test

The option in clinical laboratory science is an integrated program, accredited by the National Accrediting Agency for Clinical Laboratory Sciences, 8410 West Bryn Mawr Avenue, Suite 670, Chicago, IL 60631-3415, telephone 312-714-8880. The accreditation officials are David K. Rubin, MD (Medical Advisor), and Dorothy A. Bergeron, MS (Program Director). Academic and technical competence are developed in the major areas of clinical laboratory practice: hematology, clinical chemistry, clinical microbiology and immunohematology. The clinical laboratory theory and methods integrated throughout the four-year curriculum culminate with a clinical practicum in an affiliated hospital during the second semester of the senior year. Laboratory instrumentation, use of computers in laboratories, and quality assurance are emphasized throughout.

Careers are available in hospital, independent, public health, industrial, pharmaceutical, and private laboratories as scientists and researchers, and some clinical laboratory scientists work as educators, administrators, and consultants. By presenting a diverse background in science, analytical skills, and problem-solving, medical laboratory science prepares students for post-graduate studies in the sciences (including chemistry, microbiology, pathology), administration (including human resource management, health service administration, and business administration) and professional schools (including medical, osteopathy, and physician assistant).

After completion of this program, the graduate will be able to demonstrate entry level competencies in the following areas of professional practice:

- collect and process biological specimens for analysis,
- perform analytical tests on body fluids, cells, and other samples,
- make critical judgments by integrating and relating data generated by the various clinical laboratory departments;
- evaluate quality control results and institute corrective procedures;
- perform preventive and corrective maintenance on equipment and instruments or refer to appropriate source for repair;
- evaluate new techniques and procedures in terms of usefulness and practicality within the context of a given laboratory's resources;
- demonstrate concern for the patient and cooperate with laboratory personnel and other health care professionals;
- communicate effectively and in a professional manner with patients, laboratory personnel, other health care professionals, and the public;
- assume responsibility for continuing professional development and competence;
- assume leadership to effect positive change in the profession;
- apply principles of safety, management and supervision, education methodologies, and current information systems.

Entrance to the Upper Division of the Option in Clinical Laboratory Science

The Committee on Advanced Standing meets each year to evaluate the academic and professional progress of students who have completed sophomore-level requirements. After reviewing the records, the committee recommends to the department faculty those students to be admitted to the upper division of the option in clinical laboratory science. Each student's record is reviewed individually and, if indicated, conditional acceptance with academic qualifications is granted.

Admission to the upper division of the option in clinical laboratory science requires:
1
completion of all prerequisites in the first two years as outlined in the requirements;
2
a minimum cumulative science grade point average of 2.0 in all **completed** courses required by the major;
3
evidence that the student is making progress toward satisfying degree requirements and certification requirements;
4
signed statement from the student indicating understanding and belief that the following non-academic criteria (essential functions) can be met.

- Observation. The student must be able to participate actively in laboratory exercises and clinical experiences.
- Communication. The student must be able to communicate with fellow students, faculty, staff and members of a health care team.
- Motor. The student must have sufficient motor skills to perform basic diagnostic tests.
- Intellectual/Conceptual, Integrate and Quantitative Abilities. The student must be able to problem solve and comprehend spatial relationships of structures.
- Behavioral and Social Attributes. The student must be able to interact appropriately with fellow students, faculty, staff and members of a health care team.

A more detailed listing of the essential functions and the signature statement are available by contacting the CLS Program Director at 508-999-8329.

Clinical Practicum

The faculty assigns the students to the clinical practicum at the following affiliates: Charlton Memorial Hospital (Fall River, MA), Massachusetts General Hospital (Boston, MA), Morton Hospital and Medical Center (Taunton, MA), New England Medical Center (Boston, MA), Roger Williams Medical Center (Providence, RI), St. Anne's Hospital (Fall River, MA), St. Luke's Hospital (New Bedford, MA), and South Shore Hospital (South Weymouth, MA). Students may be assigned to a rotation at enrichment sites: Rhode Island Blood Center (Providence, RI) and State Laboratory Institute, Massachusetts Department of Public Health (Jamaica Plain, MA). Should an affiliate be unable to fulfill its oblications, the CLS program director assumes the responsibility for finding an alternative assignment for the student.

See requirements on next page.

Requirements

		Semester Credits First	Second
First Year			
MLS 115	Fundamentals of Medical Laboratory Science	1	
MLS 116	Fundamentals of Medical Lab Sci Techniques	1	
MLS 121	Human Genetics		3
MLS 122	Human Genetics Laboratory		1
CHM 151, 152	Principles of Modern Chemistry I, II	3	3
CHM 161, 162	Introductory Applied Chemistry I, II	1	1
MTH 104	Fundamentals of Statistics		3
ENL 101, 102	Critical Writing and Reading I, II	3	3
	General Education/Distribution Requirements	6	3
		15	**17**
Second Year			
MLS 221	Pathophysiology		3
MLS 222	Pathophysiology Laboratory		1
MLS 241	Clinical Chemistry Applied to Diagnostic Techniques		3
MLS 242	Clinical Chemistry Applied to Diagnostic Techniques Laboratory		1
BIO 111	Introduction to Human Physiology	4	
CHM 251	Organic Chemistry I	3	
CHM 263	Bio-Organic Chemistry Laboratory	1	
	General Education/Distribution Requirements	6	9
		14	**17**
Integrated Program			
Third Year			
MLS 301	Principles of Microbiology	4	
MLS 303	Principles of Microbiology Laboratory	1	
MLS 313	Medical Microbiology		3
MLS 314	Medical Microbiology Laboratory		1
MLS 325	Clinical Immunobiology	3	
MLS 326	Clinical Immunobiology Laboratory	1	
MLS 331	Fundamentals of Clinical Hematology		2
MLS 332	Fundamentals of Clinical Hematology Lab		1
MLS 341	Clinical Instrumental Analysis		2
MLS 342	Clinical Instrumental Analysis Laboratory		1
PHL 317	Ethics and Health Care Professionals		3
	Free Electives	3	
		12	**13**
Fourth Year			
MLS 401, 411	Clinical Microbiology I, II	5	4
MLS 421, 422	Immunohematology I, II	2	2
MLS 443, 444	Clinical Biochemistry I, II	5	4
MLS 431, 432	Hematology I, II	3	3
MLS 428	Clinical Microscopy and Serology	2	
MLS 450	Senior Seminar		2
		17	**15**
	Total Credits		**120**

Note: The department has renumbered many courses; refer to earlier catalogues for previous numbers.

General Education Departmental Requirements

Students majoring in the Clinical Laboratory Science option will meet their departmentally-controlled General Education requirements as follows:

Area E: Satisfied by PHL 317
Area I, Tier 2: Satisfied by MLS 242, 341, 342, 443, and 450
Area W, Tier 2: Satisfied by ENL 266
Area O: Satisfied by MLS 326 and 450

Medical Laboratory Science Major
Cytotechnology Option

Requirements

Cytotechnology, a specialty in the clinical laboratory, evaluates cells microscopically to detect morphologic changes related to benign and malignant disease. The first three years are spent on campus building a foundation in biology, chemistry, math, and medical laboratory science, followed by a one year clinical practicum in an accredited hospital program. A strong sense of responsibility, ability to concentrate, and an interest in natural science are necessary qualities for a cytotechnologist. Career opportunities are excellent.
Cytotechnologists are employed as laboratory managers, educators, medical sales representatives, technical representatives, and scientists in private and hospital-based laboratories, state, federal or industrial laboratories, research laboratories and veterinary laboratories. Graduate study possibilities include pathology, anatomy, or genetics.

		Semester Credits First	Second
First Year			
MLS 115	Fundamentals of Medical Laboratory Science	1	
MLS 116	Fundamentals of Medical Lab Sci Techniques	3	
MLS 121	Human Genetics		3
MLS 122	Human Genetics Laboratory		1
CHM 151, 152	Principles of Modern Chemistry I, II	3	3
CHM 161, 162	Introductory Applied Chemistry I, II	1	1
MTH 104	Fundamentals of Statistics		3
ENL 101, 102	Critical Writing and Reading I, II	3	3
	General Education/Distribution Requirements	3	
		15	**14**
Second Year			
MLS 221	Pathophysiology		3
MLS 222	Pathophysiology Laboratory		1
MLS 241	Clinical Chemistry Applied to Diagnostic Techniques		3
BIO 221	Anatomy and Physiology I	3	
BIO 222	Anatomy and Physiology II		3
BIO 223	Anatomy and Physiology Laboratory I	1	
BIO 224	Anatomy and Physiology Laboratory II		1
	General Education/Distribution Requirements	12	4
		16	**15**
Third Year			
MLS 301	Principles of Microbiology	4	
MLS 331	Fundamentals of Clinical Hematology		2
MLS 332	Fundamentals of Clinical Hematology Lab		1
MLS 352	Medical Laboratory Science Seminar II		2
MLS	Elective	3	
PHL 317	Ethics and Health Care Professionals		3
	General Education/Distribution Requirements/ Free Electives	9	6
		16	**14**
Fourth Year			
MLS 461	Introduction to Cytotechnology	1-3	
MLS 462	Special topics in Cytotechnology		1-3
MLS 463	Cytopathology	1-4	
MLS 464	Medical Cytology		1-4
MLS 465	Cytotechnology Seminar	1-2	
MLS 466	Applied cytotechnology		1-3
MLS 467	Cytology Practicum I	1-8	
MLS 468	Cytology Practicum II		1-8
		15	**15**
	Total Credits		**120**

Note: The department has renumbered many courses; refer to earlier catalogues for previous numbers.

Entrance to the Option in Cytotechnology

Students interested in this option are encouraged to discuss cytotechnology with the department chairperson as early as possible to select the most appropriate courses. Application for this option should be made during the spring semester of the sophomore year and no later than the fall semester of the junior year. Generally, students apply for admission to the accredited hospital program in the spring semester of the junior year.

Each hospital cytotechnology program determines the number of credits in a specific course based on the nature of the laboratory and the range of case presentations. A minimum of thirty credits from the courses listed in the fourth year are granted at the completion of the hospital cytotechnology program.

All students must be recommended by the department chairperson to the approved hospital program. The university cannot guarantee placement in an approved hospital program.

Clinical fees are established by the hospital program. Students are required to pay this fee in addition to the usual university fees.

General Education Departmental Requirements

Students majoring in the Cytotechnology option will meet their departmentally-controlled General Education requirements as follows:

Area E: Satisfied by PHL 317
Area I, Tier 2: Satisfied within hospital placement, as arranged between MLS Department Chairperson and placement supervisor, MLS 461
Area W, Tier 2: Satisfied by ENL 266
Area O: Satisfied by MLS 307 and 468

Medical Laboratory Science Courses

The option in biotechnology is designed to provide students with the knowledge, skills, and technical abilities necessary to pursue a career in the biotechnology world after graduating.

Entrance to the Option in Biotechnology

Students interested in this option are encouraged to discuss biotechnology with the department chairperson. Application for this option should be made during the spring semester of the sophomore year and no later than the fall semester of the junior year.

Requirements

The first seven semesters of the curriculum are the same as that for students pursuing the Clinical Laboratory Science option.

In the second semester of the senior year, students in the biotechnology option take the following four courses:

MLS 471	Introduction to Biotechnology
MLS 472	Topics in Biotechnology
MLS 473	Biotechnology Practicum I
MLS 474	Biotechnology Practicum II

All students must be recommended by the department chairperson to an approved biotechnology industrial site. The university cannot guarantee placement in an approved biotechnology industrial site.

MLS 105 three credits **S**
Contemporary Topics in Human Ecology I
Medical-social problems as they relate to modern society. Contemporary topics such as over-the-counter drugs, eugenics, factors affecting I.Q., basic human physiology, the disease state, and diabetes are discussed.

MLS 106 three credits **S**
Contemporary Topics in Human Ecology II
Medical-social problems as they relate to modern society. Contemporary topics such as stress, sexuality, inheritance, and aging are discussed.

MLS 115 one credit
Fundamentals of Medical Laboratory Science
Specialty areas, professional issues, career mobility and an introduction to the university and its facilities presented in lectures, field trips and laboratory experiences. Student Resource Center facilities will be utilized during class time.

MLS 116 one credit
Fundamentals of Medical Laboratory Science Techniques
An orientation to clinical laboratory techniques.

MLS 121 three credits
Human Genetics
An intensive survey of genetic mechanisms emphasizing the effect on human inheritance and disease.

MLS 122 one credit
Human Genetics Laboratory
Corequisite: MLS 315
Laboratory correlated with MLS 315.

MLS 221 three credits
Pathophysiology
Prerequisite: BIO 111 or perm. of instructor
The selection, generation, and translation of basic information for the diagnosis, prognosis and management of clinical samples. Health screen vs. diagnostic and prognostic profiles will be discussed.

MLS 222 one credit
Pathophysiology Laboratory
Corequisites: MLS 116, 221
Prerequisite: MLS 116 or perm. of instructor
Laboratory correlated with MLS 221.

MLS 241 three credits
Clinical Chemistry Applied in Diagnostic Techniques
Prerequisites: CHM 152, 162; or perm. of instructor.
Medically relevant carbohydrates, proteins, lipids, hormones, nonprotein nitrogenous substances, and enzymes will be discussed.

MLS 242 one credit
Clinical Chemistry Applied in Diagnostic Techniques Laboratory
Corequisite: MLS 241
Laboratory correlated with MLS 241.

MLS 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; perm. of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

MLS 301 four credits
Principles of Microbiology
Prerequisite: MLS 241 or perm. of instructor
This course presents the basic concepts of physiology, genetics, morphology, ecology, systematics and control of microorganisms.

MLS 303 one credit
Principles of Microbiology Laboratory
Corequisite: MLS 301
Laboratory correlated with MLS 301.

MLS 313 three credits
Medical Microbiology
Prerequisite: MLS 301
The theoretical basis for an in-depth understanding of organisms of medical importance. Stress shall be placed on bacterial physiology as it relates to disease. Quality control, statistical methods, and current literature shall be analyzed.

MLS 314 one credit
Medical Microbiology Laboratory
Corequisite: MLS 313
Prerequisite: MLS 303 or perm. of instructor
Laboratory correlated with MLS 313.

MLS 325 three credits
Clinical Immunobiology
The emerging concepts of immunobiology. Topics will include immunogens, immunoglobulins, autoimmunity, infection and immunity, immunohematology, and tumor biology.

MLS 326 one credit

Gen Ed note: Medical Laboratory Science courses satisfy the Natural Science and Technology requirement. Those marked **S** are appropriate for non-science/engineering majors.

Clinical Immunobiology Laboratory
Corequisite: MLS 325
Laboratory correlated with MLS 325.

MLS 331 two credits
Fundamentals of Clinical Hematology
Prerequisites: MLS 121, 122, 221, 222; or perm. of instructor
Introduction to the pathophysiology of anemias, leukocyte dyscrasias and disorders. Topics may include bone marrow activity, cell energetics, testing protocols and examples of various modalities of therapy.

MLS 332 one credit
Fundamentals of Clinical Hematology Laboratory
Corequisite: MLS 331
Prerequisites: MLS 121, 122, 221, 222; or perm. of instructor
Introduction to the morphology and biochemical testing of cells involved in anemias, leukocyte dyscrasias and other disorders. Topics may include bone marrow morphology, peripheral blood morphology and cytochemical testing protocols.

MLS 341 two credits
Clinical Instrumental Analysis
Prerequisite: MLS 241 or perm. of instructor
Study of chemical and analytical techniques used in clinical laboratory analysis. Topics include photometric, electrochemical, and immunochemical separation used in research, forensic, and medical applications.

MLS 342 one credit
Clinical Instrumental Analysis Laboratory
Corequisite: MLS 341
Prerequisite: MLS 242
Laboratory course correlated with MLS 341.

MLS 351 one to three credits
Medical Laboratory Science Seminar I
Prerequisite: Junior or senior standing or perm. of instructor
Selected topics shall be presented, determined by current interests and developments in clinical laboratory science.

MLS 352 one to three credits
Medical Laboratory Science Seminar II
Prerequisites: Junior or senior standing and perm. of chairperson
Selected topics shall be presented by both faculty and students. Topics shall be submitted from affiliated hospitals.

MLS 381 three credits
Health Care Legislation
Major, recent, and pending health care legislation and its impact on the provider will be discussed. Possible topics include: Medicare, Medicaid, health manpower, accreditation, licensure, professional standards review, health systems agencies, and national health insurance.

Senior Courses: Option in Clinical Laboratory Science

The following courses are presented on campus and at affiliated hospitals for an academic year that may exceed the regular academic year. This year will consist of 40 hours per week on campus and/or in affiliated hospital(s). Lecture and laboratory hours shall comply with the standards set by the National Accrediting Agency for Clinical Laboratory Sciences. These are open only to medical laboratory science students or by perm. of the Department.

MLS 401 five credits
Clinical Microbiology I
Prerequisites: MLS 313, 314
The principles or practice of diagnostic microbiology such as specimen collection and handling, quality control, and laboratory safety. Clinical correlation, immunology and hospital surveillance will be included.

MLS 411 four credits
Clinical Microbiology II
Prerequisite: MLS 401
Continuation of MLS 401.

MLS 421 two credits
Immunohematology I
The principles of blood banking, including the preparation and storage of blood and its components, donor evaluation, transfusion, required record keeping, and processing of frozen blood. Clinical correlation, quality control and laboratory safety will be included.

MLS 422 two credits
Immunohematology II
Prerequisite: MLS 421
Continuation of MLS 421.

MLS 428 two credits
Clinical Microscopy and Serology
Prerequisites: MLS 325, 326
The applied principles of the clinical evaluation of the physical and chemical constituents and formed elements of kidney filtrate. Quality control, laboratory safety and clinical correlation shall be covered.

MLS 431 three credits
Hematology I
Prerequisites: MLS 331, 322
Subjects include the analysis and clinical correlation of quantitative and qualitative variations in blood. Blood cell and other formed element morphology, the dynamics of coagulation, processing and evaluation of human bone marrow, quality control and laboratory safety will be studied.

MLS 432 three credits
Hematology II
Prerequisite: MLS 431
Continuation of MLS 431.

MLS 443 five credits
Clinical Biochemistry I
Prerequisites: MLS 341, 342
Principles of the physical and chemical analysis of medically significant organic and inorganic substances found in human body fluids and tissues. Laboratory instrumentation and electronics, metabolic screening, specimen collection, clinical correlation, quality control and laboratory safety will be emphasized.

MLS 444 four credits
Clinical Biochemistry II
Prerequisite: MLS 443
Continuation of MLS 443.

MLS 450 two credits
Senior Seminar
Prerequisites: MLS 411, 421, 432, and 444; or perm. of the instructor.
Intensive, integrated study of selected topics in clinical laboratory science including management.

Senior Courses: Option in Cytotechnology

MLS 461 one to three credits
Introduction to Cytotechnology
Prerequisite: Perm. of chairperson
A review of cell structure, principles of microscopy, and staining techniques. Anatomy and physiology of the female reproductive system and study of the non-malignant cytology of the female genital tract will be covered.

MLS 462 one to three credits
Special Topics in Cytotechnology
Prerequisite: Perm. of chairperson
Special projects in cytology, cytopathology or cytotechnology are investigated or reviewed and reported by the student. Written or oral presentation is required.

MLS 463 one to four credits
Cytopathology
Prerequisite: Perm. of chairperson
Cytopathology and clinical aspects of cervical dysplasia, carcinoma-in-situ and invasive squamous cell carcinoma. Consideration of endometrial and endocervical carcinoma, other genital tract cancers and radiation effect.

MLS 464 one to four credits
Medical Cytology
Prerequisite: Perm. of chairperson
Benign and malignant cytology of the respiratory and gastrointestinal tracts will be correlated with anatomy and physiology. Benign, a-typical, and malignant exfoliative cells from the urinary tracts, serous effusion, cerebrospinal fluid and breast secretions will be studied.

MLS 465 one to two credits
Cytotechnology Seminar
Prerequisite: Perm. of chairperson
Presentation, discussion and interpretation of benign, suspicious, and hormonal conditions. The cytological diagnostic criteria of malignant tumors from various body sites and their histopathological correlation will be studied.

MLS 466 one to three credits
Applied Cytotechnology
Prerequisite: Perm. of chairperson
The microscopic evaluation and screening of cytological smears from various body sites. Effects of radiation and of chemotherapy; diagnosis of suspicious and hormonal conditions; cytological observations in pregnancy. Cell research techniques. Epidemiology and current concepts related to cytotechnology.

MLS 467 one to eight credits
Cytology Practicum I
Prerequisite: Perm. of chairperson
The microscopic evaluation and screening of benign cytological smears and smears from cervical dysplasia; carcinoma-in-situ, and invasive malignant tumors of the female genital tract.

MLS 468 one to eight credits
Cytology Practicum II
Prerequisite: Perm. of chairperson
The microscopic evaluation and screening of cytological smears from the respiratory tract, gastrointestinal tract, urinary tract and from body fluids. Continuing evaluation of cytological smears from the gynecological tract.

Senior Courses: Option in Biotechnology

MLS 471 three credits
Introduction to Biotechnology
Prerequisite: Perm. of chairperson
Basic concepts of biotechnology gene theory, application, and bioinformatics. A survey of genetic mechanisms of inheritance and disease and the use of bioinformatics as a research tool are included.

MLS 472 three credits
Topics in Biotechnology
Prerequisite: Perm. of chairperson
Integrated study of selected topics in biotechnology. Evolving concepts in biotechnology are investigated and presented. Written and oral presentations are required.

MLS 473 three credits
Biotechnology Practicum I
Prerequisite: Perm. of chairperson
Principle and procedures in various aspects of biotechnology to include proteomics and bioinformatics. Laboratory and administrative issues appropriate to the practicum site are included.

MLS 474 three credits
Biotechnology Practicum II
Prerequisite: Perm. of chairperson
Continuation of MLS 473.

Senior courses for all options

MLS 495 one to four credits
Independent Study
Prerequisites: Upper-division standing; perm. of instructor, department chairperson, and college dean
The student selects a topic for in-depth study. Readings and reports are supervised by a member of the faculty.

MLS 196, 296, 396, 496 three credits
Directed Study
Prerequisites: Perm. of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

MLS 497 two credits
Research Project
4 hours per credit hour per week.
Prerequisite: Perm. of instructor
The student initiates a proposal on a selected research topic. The research is done under the supervision of the appropriate faculty member. A completed paper is required.

MLS 498 one to four credits
Research Project
Continuation of MLS 497.

Graduate Courses

MLS 510 three credits
Bioethics
Issues and cases in bioethics, across the range of medical practice, individual rights, and social implications.

MLS 522 three credits
Evidence and Courtroom Proceedings
The use of DNA evidence in the court. The implications of relevancy, competency, impeachment, hearsay, and expert testimony will be discussed. Constitutional issues of privacy, informed consent, and mandated registries will be weighed. Special considerations will be presented, from issues of paternity and the sanctity of marriage to the practical issues of specimen collection, quality, and processing.

MLS 525 three credits
Pathophysiology
Investigations of the aberrations of normal physiology, with the processes that bring about these disruptions. The course covers the ways in which the disruptions manifest themselves as symptoms, signs, physical findings, and laboratory findings, including advanced topics in the selection, generation, and translation of information for the diagnosis, prognosis, and management of clinical samples.

Multidisciplinary Studies

The Multidisciplinary Studies major may be earned as a BS or BA degree depending on the design of the program of study

Requirements

Program Director, Dorothy Bergeron
Professor of Medical Laboratory Science

Students with a GPA of at least 2.5 who wish to pursue in depth a particular topic or area of study not available in an established major may choose the Multidisciplinary Studies (MDS) major. MDS allows students to combine course work in two or three disciplines to create their own major, in consultation with a faculty advisor and the Director of Multidisciplinary Studies. Considerable latitude is allowed in the design of the program of study, and course work, studios and laboratories from any of the colleges may be included, as long as one of the Core disciplines is in Arts and Sciences. Examples of topics or themes chosen by MDS majors are

Communications/Photography
Environmental Studies
Society and Aging
Sociobiology

Multidisciplinary Studies is intended as an option for students who have some familiarity with college-level study. Thus it is available only to students who have completed at least one semester of college work, and not to entering freshmen. Transfer applicants with a minimum of 15 transferable credits may receive admission, if otherwise qualified, upon the recommendation of the MDS Director, based on a personal interview. The earlier a program of study is designed, the greater the flexibility in scheduling the required courses. As with most other changes of major, requests from seniors can rarely be accommodated. Students may use not MDS as one program within a double major.

Interested students should contact the Director of Multidisciplinary Studies, at 508 999-8584.

The Multidisciplinary Studies major is built around a thematic program of study that encompasses two or three disciplines, one of which must be in the College of Arts and Sciences. The program will consist of a minimum of 36 credits in the selected disciplines, 30 of which must be at the 300 level or above and constitute the Core courses of the major. (Experiential learning and courses in pedagogy may not be included in the 300- and 400-level courses.) Ordinarily only three credits of either independent study or directed study may be included in the 30 credits of Core courses.

Students who wish to incorporate business as one of their disciplines must adhere to the requirements of the agency that accredits the Charlton College of Business. Under these guidelines the number of business courses that a non-business major can take is limited. In addition, business-related terms cannot appear in the title of the MDS degree. For these reasons, an MDS proposal that includes business courses must receive approval from the assistant dean of undergraduate programs in the College of Business.

To become MDS majors students must, before the end of their junior year:

1
Identify a faculty member as academic advisor who, along with the Director, will assist in the design of the program.
2
Write a one-page description of the proposed program of study and complete a change of major form with the Director. The description should include the objectives of the program and a rationale for how each of the Core courses will help meet the objectives.
3
Develop, with the Director, a Contract containing the description and a list of the courses that will comprise the program. Substitution for courses in the Contract is allowed only with prior written approval by the faculty advisor and the Director.

Multidisciplinary Studies Major
BA degree

For the BA degree, students must satisfy all College of Arts and Sciences requirements for that degree, along with the program of courses listed in the Contract.

Multidisciplinary Studies Major
BS degree

For the BS degree, students must satisfy all College of Arts and Sciences requirements for that degree, along with the program of courses listed in the Contract. The Contract must contain the components of either of the two options given below:

Option 1

a 36 credits in two or three sciences,* 30 of which are at the 300-level or higher.

b A two-semester sequence of mathematics, if mathematics is not a component of a) above.

Option 2

a 15 credits at the 300-level or above in one or two sciences.

b 15 credits at the 300-level or above in one or two disciplines other than science.

c 9 credits in sciences at any level, other than disciplines included in a) above.

d A two-semester sequence of mathematics, if mathematics is not a component of a) or c) above.

*For these options, "Sciences" include Biology, Chemistry, Computer Science, Mathematics, Medical Laboratory Science, and Physics.

General Education Departmental Requirements

Students majoring in Multidisciplinary Studies must pay special attention to selecting courses so as to satisfy both their general education and college distribution requirements. Courses used to satisfy major and college distribution requirements may also be used to satisfy specific University General Education requirements.

The University General Education requirements in categories C and S, and Tier 1 of categories I and W are automatically met through the BA or BS versions of the Arts and Sciences college distribution requirements. Special care must be taken to identify specific courses that satisfy the D, E, and G categories. Students will normally satisfy "departmental" requirements in the Tier II General Education categories (I and W), and in Oral Communication, through one of the Core discipline departments chosen for the major. Students are ultimately responsible for meeting all distribution and General Education requirements and should consult with their advisors on both major and General Education requirements.

Philosophy

Faculty and Fields of Interest

Philosophy is the cornerstone of the humanities. A major in philosophy cultivates the development of analytical skills and clarity of thought that are invaluable, not only in pursing a college degree, but later in developing a rewarding career and a meaningful life. Training in philosophy is highly regarded in professional fields such as law, medicine, artificial intelligence, and government.

The faculty in the department have a diversity of backgrounds and areas of specialization. This makes possible a solid grounding in the history of philosophy and in the various sub-areas of philosophy, areas such as ethics, logic, metaphysics, philosophy of religion, philosophy of science, and philosophy of language. The approach of the department is pluralistic.

Diane Barense philosophy of logic, philosophy of science, philosophy of language, philosophy of mind, philosophy of feminism

Philip Cox (chairperson) ethics, medical ethics, philosophy of law, social theory

Catherine Villanueva Gardner ethics, feminist philosophy

James Gordon Place history of philosophy, contemporary European philosophy, aesthetics

Philosophy Major
BA degree

Requirements

		Credits
PHL 110	Logic (PHL 108 Critical Thinking or PHL 235 Symbolic Logic may be substituted)	3
PHL 221	History of Western Philosophy: Ancient (PHL 223 History of Western Philosophy: Medieval may be substituted)	3
PHL 222	History of Western Philosophy: Modern	3
Two courses in contemporary philosophy selected from:		
PHL 361	Contemporary Continental Philosophy	6
PHL 371	Contemporary Anglo-American Philosophy	
PHL 382	Contemporary American Philosophy	
One seminar course:		
PHL 409	Seminar	3
At least three courses in systematic philosophy selected from courses numbered 300-349		
PHL 300	Special Topics	9
PHL 301	Theory of Knowledge	
PHL 303	Metaphysics	
PHL 311	Philosophy of Language	
PHL 315	Ethics II	
PHL 316	Political Philosophy	
PHL 318	Bioethics	
PHL 320	Philosophy of Science	
PHL 323	Philosophy of Art	
PHL 324	Philosophy of History	
PHL 325	Philosophy of Religion	
PHL 326	Philosophy of Law	
PHL 332	Philosophy of Human Nature	
Two courses selected from the following list:		
PHL 101	Introduction to Philosophy	6
PHL 102	Philosophical Aspects of Feminism	
PHL 105	Special Topics	
PHL 108	Critical Thinking (if not taken above)	
PHL 200	Special Topics in Philosophy	
PHL 207	Introduction to Aesthetics	
PHL 210	Socrates	
PHL 215	Ethics I	
PHL 222	History of Western Philosophy: Modern (if not taken above)	
PHL 223	History of Western Philosophy: Medieval (if not taken above)	
PHL 224	Nineteenth Century Philosophic Thought	
PHL 226	Marx	
PHL 227	Nietzsche	
PHL 232	Inductive Inference	
PHL 235	Symbolic Logic (if not taken above)	
	Total	**33**

General Education Departmental Requirements

Students majoring in Philosophy will meet their departmentally-controlled General Education requirements as follows.

Area E: Satisfied by coursework required of all philosophy majors

Area I, Tier II: Satisfied by a 200 or 300 level course carrying a W designation. Students are required to submit a sample paper from this course, demonstrating advanced word-processing skills and web-based research, to the Chair of the Philosophy Department during the semester preceding graduation

Area W, Tier II: Satisfied by a 300 level philosophy course that carries a W designation

Area O: Satisfied by a course from the approved list of O designated courses

Philosophy Minor

Requirements

		Credits
One course in the history of philosophy		
PHL 221	History of Western Philosophy: Ancient **OR**	3
PHL 222	History of Western Philosophy: Modern **OR**	
PHL 223	History of Western Philosophy: Medieval	
Four courses selected from the following list, with the understanding that two of the courses must be upper division (numbered between 300 to 391):		
PHL 101	Introduction to Philosophy	12
PHL 102	Philosophical Aspects of Feminism	
PHL 105	Special Topics	
PHL 110	Logic	
PHL 200	Special Topics	
PHL 207	Introduction to Aesthetics	
PHL 210	Socrates	
PHL 215	Ethics I	
PHL 221	History of Western Philosophy: Ancient (if not taken above)	
PHL 222	History of Western Philosophy: Modern (if not taken above)	
PHL 223	History of Western Philosophy: Medieval (if not taken above)	
PHL 224	Nineteenth Century Philosophic Thought	
PHL 226	Marx	
PHL 227	Nietzsche	
PHL 232	Inductive Inference	
PHL 235	Symbolic Logic	
PHL 300	Special Topics	
PHL 301	Theory of Knowledge	
PHL 303	Metaphysics	
PHL 311	Philosophy of Language	
PHL 315	Ethics II	
PHL 316	Political Philosophy	
PHL 318	Bioethics	
PHL 320	Philosophy of Science	
PHL 323	Philosophy of Art	
PHL 324	Philosophy of History	
PHL 325	Philosophy of Religion	
PHL 326	Philosophy of Law	
PHL 332	Philosophy of Human Nature	
PHL 361	Contemporary Continental Philosophy	
PHL 371	Contemporary Anglo-American Philosophy	
PHL 382	Contemporary American Philosophy	
PHL 409	Seminar	3
	Total	**18**

Selection of philosophy as a minor requires that the grade point average in one's major be at least 2.5.

Philosophy Courses

PHL 101 three credits **C, E**
Introduction to Philosophy
An introduction to philosophy as the persistent and methodical attempt to think clearly about universal problems of human life, such as ways of knowing and studies in value.

PHL 102 three credits **C, W**
Philosophical Aspects of Feminism
An introduction to philosophical reasoning, analysis of arguments and developing of critical skills, through a consideration of various topics relevant to feminism. Topics may include: presuppositions about woman's nature, abortion, sex equality, affirmative action. Cross-listed as WMS 102.

PHL 105 three credits **C**
Special Topics in Philosophy
Offered as needed to present current topics in the field or other material of interest. The specific topic is stated when the course is scheduled. May be repeated with change of content.

PHL 108 three credits **C**
Critical Thinking
A course in informal logic concentrating on the evaluation of reasoning in "real life" contexts. The material for analysis will be drawn from newspaper editorials, political speeches, media articles, textbooks, advertisements, etc.; we will concentrate on arguments about issues of current public interest. The following topics will be emphasized: the identification of arguments; techniques for portraying argument structure; the evaluation and criticism of arguments; informal fallacies; the influence of language on clear thinking. This course is designed for students with no previous background in philosophy. (Students who complete this course should not enroll in PHL 110).

PHL 110 three credits **C**
Logic
An introduction to the methods and principles used to distinguish correct from incorrect reasoning. The course aims at imparting skill in identifying fallacies in reasoning and in using elementary formal techniques to analyze natural language arguments. In addition, such topics as the nature of meaning, the various uses of language, and the logic of science are discussed. (Students who complete this course should not enroll in PHL 108).

Gen Ed Key

All Philosophy courses satisfy Cultural/Artistic Literacy; lower division courses are marked **C**, but advanced courses are eligible as well Other courses satisfy other requirements as noted.

PHL 200 three credits **C**
Special Topics in Philosophy
Offered as needed to present current topics in the field or other material of interest. The specific topic is stated when the course is scheduled. May be repeated with change of content.

PHL 207 three credits **C**
Introduction to Aesthetics
An introduction to philosophy through examination of paintings, photographs, poems, novels, and music in order to discover the styles of individual commitment through which people have tried to bring meaning into their lives. While attempting to grasp the aesthetic significance of each work of art, we will continually push toward an understanding of the philosophical dimension of human life as expressed in each work.

PHL 210 three credits **C, W**
Socrates
A study of Socrates through an examination of two sorts of problems—the first (the so-called 'Socratic Problem') is the problem of evaluating the evidence which we possess about Socrates. This will proceed by reading an analysis of Aristophanes' Clouds, Xenophon's Memorabilia and Apology, some passages from Aristotle and the following 'early' dialogues of Plato: Apology, Crito, Euthyphro, the Charmides, Laches and Protagoras. The second problem to be dealt with is the extraction and evaluation of the main tenets of Socrates' philosophy, such as the claims that virtue is knowledge and that no one ever does wrong willingly.

PHL 215 three credits **C, E, W**
Ethics I
A critical examination of normative theories of obligation and value. A philosophical examination of some moral problems: abortion, euthanasia, death penalty, sexual equality, reverse discrimination, pornography and censorship, violence, and economic injustice.

PHL 221 three credits **C, W**
History of Western Philosophy: Ancient
A study of philosophy from its origin with the pre-Socratics to the middle ages. The major portion of the course will be devoted to the philosophies of Plato and Aristotle.

PHL 222 three credits **C**
History of Western Philosophy: Modern
A study of the major philosophical movements (rationalism, empiricism and critical philosophy) in the 17th and 18th centuries. Philosophers studied include Descartes, Spinoza, Leibnitz, Locke, Berkeley, Hume, Kant. In addition to these major philosophers, consideration will also be given to the work of Rousseau, Pascal, Malebranche, the French Enlightenment.

PHL 223 three credits **C**
History of Western Philosophy: Medieval
A study of the philosophical views developed from the 4th to the 14th centuries. The following Christian, Jewish and Islamic philosophers are studied: Augustine, Beothius, Scotus Erigena, Anselm, Abelard, John of Salisbury, Alfarabi, Avicenna, Averroes, Maimonides, Bonaventure, Bacon, Aquinas, Scotus, William of Ockham, Nicholas of Autrecourt, Marsilius of Padua.

PHL 224 three credits **C**
Nineteenth Century Philosophic Thought
Writings selected from a century of great philosophical vitality and versatility. The culminating achievements of the western philosophical tradition and the first powerful stirring of major contemporary trends are fed by such currents as evolutionism, empiricism, idealism, positivism, existentialism, and dialectical materialism. Philosophers studied include Hegel, Fichte, Bradley, Schopenhauer, Comte, Mill, Spencer, Marx, Kierkegaard, and Nietzsche.

PHL 226 three credits **C**
Marx
Designed as an introduction to the work of Karl Marx for those students who do not necessarily have philosophical backgrounds. The thoughts of Marx will be presented in two parts. At first, the more philosophical thought of the young Marx will be examined in its relation to Hegel and his followers up to Marx's "settling of accounts" with German philosophy. The second part will deal with the more scientific phase of Marx's thought expressed in *Das Capital*. Marx's own works will form the reading in the course. Cross-listed as LST 226.

PHL 227 three credits **C, W**
Nietzsche
A critical analysis of the major philosophical themes in Nietzsche's thought. Emphasis is placed on Nietzsche's roots in the classical tradition. Readings include most of Nietzsche's major works as well as secondary criticism.

PHL 232 three credits **C**
Inductive Inference
Prerequisites: PHL 110, 235, or consent of instructor
A critical examination of theories about the structure and justification of inductive reasoning. Included will be a study of theories of probability and of the nature of causation.

PHL 235 three credits **C**
Symbolic Logic
Prerequisite: PHL 110 or consent of instructor
A study of the formal techniques of sentential and predicate logic. The course aims at imparting skill in applying logic to natural language arguments and in recognizing and constructing correct deductions and refutations. Philosophical issues pertaining to the application of logic to natural language as well as elementary results of metalogic are discussed.

PHL 298 one to six credits
Experiential Learning
Prerequisites. At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

PHL 300 three credits
Special Topics in Philosophy
Offered as needed to present current topics in the field or other material of interest. The specific topic is stated when the course is scheduled. May be repeated with change of content.

PHL 301 three credits **W**
Theory of Knowledge
Prerequisite: Semester course in Philosophy or consent of instructor
An analysis of the scope and structure of knowledge and its relation to other human activities.

PHL 303 three credits
Metaphysics
Prerequisite: Semester course in Philosophy or consent of instructor
A study of some representative philosophical views on the general structure and ultimate explanation of reality. Some topics considered will be causality, chance and necessity, the problem of first cause.

Consideration will also be given to some objections to metaphysics as a philosophical undertaking.

PHL 311 three credits **W**
Philosophy of Language
Prerequisite: Semester course in Philosophy or consent of instructor
An examination of how language relates to the world and to thought. Topics will include the nature of meaning, truth, metaphor, and linguistic competence; speech act theory; and the relation of logic to syntax and semantics. Readings will be from contemporary linguistics as well as from philosophy.

PHL 315 three credits
Ethics II
Prerequisite: PHL 215
Concentrates on the meaning of ethical terms, the objectivity of moral judgments and the justification of these moral judgments. The Is-Ought Question is studied at some length, as well as the possibility of an ontology of morals proposed by contemporary metaphysicians.

PHL 316 three credits
Political Philosophy
Prerequisite: Semester course in Philosophy or consent of instructor
A study of some of the major themes and problems traditionally considered by political philosophers. A consideration of what constitutes a political problem and a discussion of the role of philosophy with regard to such problems. The course thus combines an analytical and an historical approach in the effort to relate traditional political thought to contemporary problems.

PHL 317 three credits **E**
Ethics and Health Care Professionals
Prerequisite: Junior standing in Medical Laboratory Science, Nursing, Psychology, or Sociology
An examination of the ethical aspects of the health care professions, and the impact of the ethical issues on the professional's life. Topics include: responsibility, conscience, professional codes of ethics, privacy, informed consent, access to health care, loss, and death. Cross-listed as GRT 317.

PHL 318 three credits
Bioethics
Prerequisite: PHL 215 or its equivalent; or consent of instructor
A study of the ethical issues related to death and dying, behavior control, genetic counseling and genetic engineering, and population limitation. The work of specific research projects and institutes will be studied.

PHL 320 three credits **W**
Philosophy of Science
Prerequisite: Semester course in Philosophy or consent of instructor, or third year in Mathematics or a science major.
A critical analysis of science and its methods, a study of the justification and the range of scientific knowledge.

PHL 323 three credits
Philosophy of Art
Prerequisite: Semester course in Philosophy or consent of instructor
Continues on a more advanced level the development of a theory of art already begun in the introduction to aesthetics. Themes to be discussed include the nature of form and expression in art, the nondiscussive character of art, the similarities and differences between the artist's relation to the work of art and the spectators', the relation between art and subjectivity, the difference between the linguistic and visual arts, the social function of art. The works of a few major philosophers will be compared to give students alternative points of view.

PHL 324 three credits
Philosophy of History
Prerequisite: Semester course in Philosophy or consent of instructor
This course will consider various theories that have been proposed for interpreting history, as well as recurrent problems about the structure of historical explanation, the possibility of objectivity in history, and the relationship between history and the social sciences.

PHL 325 three credits
Philosophy of Religion
Prerequisite: Semester course in Philosophy or consent of instructor
Analytical and constructive study of central concepts and essential manifestations of religion. Both historical and contemporary readings are required.

PHL 326 three credits
Philosophy of Law
Prerequisite: Semester course in Philosophy or consent of instructor
Approaches to the philosophy of law. The course addresses questions like, What gives meaning to law? How is the law interpreted, or how are judicial interpretations justified? What is the relationship between law and morality, or law and culture or custom? The course examines a number of state and Supreme Court opinions (on issues like free speech and expressive liberties, reproductive issues, obscenity, legal ethics, jury nullification, and hate crime legislation) with a critical eye toward their philosophical or juridical soundness. This course is valuable for those considering careers in law, public affairs or politics.

PHL 332 three credits
Philosophy of Human Nature
Prerequisite: Semester course in Philosophy or consent of instructor
An examination of the major views on the nature of human beings. The mind-body problem and the problem of freedom will be discussed.

PHL 361 three credits
Contemporary Continental Philosophy
Prerequisite: Semester course in Philosophy or consent of instructor
A study of the various currents of continental European thought in this century with special concentration on existentialism, structuralism, and post-structuralism. Husserl, Heidegger, Sartre, Merlea-Ponty, Saussure, Levi-Strauss, Lacan, Kristeva, Foucault, Derrida and others will be discussed.

PHL 371 three credits **W**
Contemporary Anglo-American Philosophy
Prerequisite: Semester course in Philosophy or consent of instructor
An examination and critique of 20th century analytic philosophy, whose dominant theme has been that philosophical problems are best understood as problems regarding the use of language. Among the writers we will discuss are Moore, Russell, Wittgenstein, Ayer, Carnap, Hemple, Ryle, Austin, Quine, Davidson, Searle, Dennett, Kripke, Putnam, and Rorty.

PHL 382 three credits
Contemporary American Philosophy
Prerequisite: Semester course in Philosophy or consent of instructor
The major positions since the late 19th century (pragmatism, idealism naturalism and process philosophy) will be studied through selected texts from Peirce, James, Royce, Dewey, Santayana and Whitehead.

PHL 409 three credits
Seminar
Prerequisite: Major or Minor in Philosophy or

consent of instructor
Intensive study of (1) major philosophers, such as Plato, Aristotle, Kant, Quine, and Wittgenstein, or (2) philosophers related by a common theme in development, such as Aquinas, Scotus, Ockham, or Locke, Berkeley, Hume, or Descartes, Spinoza, Leibnitz, or (3) current philosophical work. May be repeated with change of content.

PHL 420 three credits
Directed Honors Thesis
Prerequisite: Major in Philosophy and 3.0 average in philosophy courses
Departmental guidance for a thesis developing out of the primary and continuing interest of the student.

PHL 495 three credits
Independent Study
Prerequisites: Philosophy major; Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

PHL 196, 296, 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Political Science

Political Science offers a variety of courses in the major subfields of the discipline: American politics, comparative politics, international relations, political theory, public administration, and public policy. The program emphasizes the development of analytical and communications skills linked to a substantive understanding of politics, governments, and administration. These skills and a knowledge of political science are useful in a broad range of career pursuits.

UMass Dartmouth Political Science graduates are pursuing successful careers in state, local, and federal government, public law, administration, social work, urban planning, the diplomatic service, and business. Some have careers in politics as elected officials, legislative aides, or in lobbying, campaign management, and polling analysis. The departmental program offers several opportunities for student internships that provide practical experience in many of these areas. Finally, many of the department's graduates enroll in some of the nation's leading law, graduate, and professional schools where they go on to careers in college teaching, law, and corporate management.

The Political Science faculty is active in research, government, and community service, and publishes many books and articles in the several subfields of the discipline.

Faculty and Fields of Interest

Michael Baum comparative politics (Western and Southern Europe Africa, Latin America), theory, development studies and policy

John J. Carroll (chairperson; director of university academic advising) American politics (institutions, state governments), public law

Robert Darst international politics, environmental politics

John Fobanjong American government, ethnic politics, public administration, international relations (Africa)

Kenneth L. Manning constitutional law, judicial behavior, American politics

Philip H. Melanson public policy, American politics (governmental secrecy, political violence)

Michael Steinman (dean of the college of arts and sciences) American politics, public policy

Political Science Major
BA degree

Requirements

Political Science majors complete 39 credits in political science. In addition, majors must satisfy specific a cognate requirement in selecting their distribution courses for the Bachelor of Arts degree.

The following courses are required:

		Credits
PSC 101	Intro. to American Politics	3
PSC 151	Introduction to Comparative Politics	3
PSC 161	Introduction to International Relations	3
PSC	200-level elective	3
PSC 349	Research Methods in Political Science	3

One courses in Political Theory from the following list: 3

PSC 320 American Political Thought I
PSC 321 American Political Thought II
PSC 351 Modern Political Thought
PSC 352 Classical Political Thought
PSC 353 Non-Western Political Thought
PSC 354 Contemporary Political Thought
PSC 357 Marxian Political Theory

One course in American Politics/Policy 3

One course in Comparative Politics/ International Relations. A course can be selected that will also satisfy the non-western course requirement. 3

PSC 300/400-level electives 6

PSC 305 Internship 3
Additional Internship credits may be counted as free electives.

PSC 400-level Research Seminars 6
(One each in junior and senior years)

Total **39**

Cognate requirement:
ECO 232 Macroeconomics
A non-western course

Macroeconomics complements and supports the major concentration and also satisfies a portion of the distribution requirements in social sciences in the College of Arts and Sciences. The non-western course requirement may be satisfied by a course in a discipline other than Political science or by an appropriate Political Science course.

General Education Departmental Requirements

Students majoring in Political Science will meet their departmentally-controlled General Education requirements as follows:

Area E: Satisfied by ECO 232
Area I, Tier 2: Satisfied by PSC 349
Area W, Tier 2: Students may choose a course from the approved list
Area O: Satisfied by two PSC 400-level seminars.

Political Science Honors Program

The Political Science Department offers an Honors Program to qualified majors. To be admitted to the program, students must demonstrate outstanding scholarship during their first five semesters. Details of the program may be obtained from the Department Chairperson.

Political Science Minor

Students choosing to Minor in Political Science must achieve at least a 2.5 average in all Political Science courses and a 2.0 cumulative grade point average. Students must formally declare the minor by the end of their fifth semester and must have completed 54 credits. Appropriate forms will be available from faculty advisors in the Political Science department.

Requirements

The minor in political science consists of 21 credits. Minor course credits must be taken with at least three different professors.

The following courses are required:

		Credits
PSC 101	Intro. to American Politics	3
PSC 151	Intro. to Comparative Politics	3
PSC 349	Research Methods in Political Science	3
PSC 300-level electives		9
PSC 400-level Research Seminar		3
	Total	**21**

Political Science Courses

PSC 101 three credits **E**
Introduction to American Politics
Theory and practice of national government in Congress, the Presidency, and the Supreme Court, and the interaction of these institutions with interest groups, political parties, public opinion and the mass media.

PSC 151 three credits **G**
Introduction to Comparative Politics
Study of political processes, ideologies, constitutional systems and governmental structure of foreign countries including Great Britain, France, Germany, the C.I.S. and selected Third World nations. Comparison with American system of government. Stress laid on the use of the analytical methods.

PSC 161 three credits **G**
Introduction to International Relations
Helps students relate, organize, and analyze political events that occur on the international level. Students will learn how to think critically about international relations and its impact on lives and well-being in the present and future. The concept of power, the factors that shape the foreign policies of states, the politics of economic relations, the use of force, and a broad range of global issues are examined.

PSC 201-249 three credits
American Political Issues and Ideas
Issues and ideas courses on selected topics to be developed by instructors as student interest and faculty preference indicate. Students who are not political science majors are particularly invited to enroll in such courses. Anticipated offerings in this category include Introduction to Political Economy, Local Politics, Political Essay, Political Assassinations in America, Fundamentals of Political Behavior.

The following are regularly offered:

PSC 201 three credits
Class, Power, and the State

PSC 210 three credits
Politics of Health Care Reform

PSC 212 three credits
Politics in Film

PSC 228 three credits
Problems of Law in Political Science

PSC 239 three credits **C, D**
African American Politics
A study of the role of African Americans in

Gen Ed Key

C	Cultural and Artistic Literacy
E	Ethics and Social Responsibility
G	Global Awareness
D	Diversity
W	Writing-Intensive Course
I	Information and Computer Literacy
O	Oral Skills

the American political system, both historically and contemporarily, with special attention given to the alternative political strategies used in the struggle for political inclusion. Various philosophies that have been adopted to open up the political process and increase the democratic participation of African Americans are studied. Cross-listed as AAS 239.

In addition, the following have been offered recently:

PSC 208 three credits
Politics of Welfare Reform

PSC 222 three credits
Political Assassination in America

PSC 224 three credits
Modern Employment Laws and Development in the Workplace

PSC 227 three credits
Campaigning for Congress

PSC 23S three credits
Environmental Policy

PSC 236 three credits
People and Politics

PSC 237 three credits
Politics of Free Speech and Religion

PSC 242 three credits
Ethnic Politics
Prerequisites: PSC 101
The complex ethnic structure of the American political landscape. The course examines the role that ethnicity plays in American politics in a comparative examination of the politics of major racial and ethnic minority groups. Previously offered as PSC 266. Cross-listed as AAS 243; LST 243.

PSC 2S1-299 three credits
World Political Issues and Ideas
Issues and ideas courses on selected topics to be developed by instructors as student interest and faculty preference indicate. Students who are not political science majors are particularly invited to enroll in such courses. Anticipated offerings in this category include Contemporary Issues in the Middle East, Contemporary Issues in World Politics, and Contemporary Issues in Human Rights.

The following are regularly offered:

PSC 258 three credits
Political Psychology

PSC 261 three credits **G**
Problems US/China Relations

PSC 266 three credits
Introduction to the Politics of Developing Countries

PSC 291 three credits
Contemporary Issues in Human Rights
Central concepts in human rights and international barriers to action. This discussion course addresses questions like, Can or should human rights be protected internationally? Is it possible to balance conflicting rights? What is the continuing role of torture in Europe and elsewhere?

In addition, the following have been offered recently:

PSC 2S3 three credits
Contemporary Issues: US and Middle East

PSC 277 three credits
Africa in World Politics

PSC 286 three credits
Contemporary Issues in World Politics

PSC 301 three credits
The Presidency
Prerequisites: PSC 101 and upper-division standing
The development of the contemporary presidency and its position within the American constitutional framework. Special attention will be paid to the presidential selection system, to alternate models of the presidency and to presidential power.

PSC 302 three credits
The Legislative Process
Prerequisites: PSC 101 or permission of the instructor; and upper-division standing
A thorough study of the United States Congress and its power to make law. Elections, legislative leadership, congressional committees, inter-branch relations, and the dynamics of the legislative process are some of the sub-themes.

PSC 303 three credits **C, D, G**
Cape Verdean Politics and Society
A study of Cape Verdeans as an ethnic subpopulation in the United States, and as comprising an independent, self-governing nation-state. The historical, political, social, and economic contributions of Americans of Cape Verdean descent in the United States and in Cape Verde are examined. Cross-listed as AAS 303; LST 303.

PSC 304 three credits **W**
Bureaucratic Politics
Prerequisite: PSC 101 or prior coursework in social science
A broad overview of the development and performance of bureaucratic institutions in the U.S. political system, exploring the extraordinary expansion of bureaucratic authority in recent decades and various explanations of government growth. A review of the historical development of bureaucratic institutions will set the stage for subsequent discussions of the performance of public sector organizations and prospects for significant reform in the next decade.

PSC 30S three to fifteen credits
Internship
Students take part in internship opportunities in the public and private sector, in conjunction with a series of five on-campus seminars with core readings designed to integrate the student's real-world experience with the academic discipline. Students are placed on congressional and state legislative staffs, in state and local government, in the judicial system, in prosecutors' offices, in law firms, and a variety of other public and non profit organizations.

PSC 306 three credits **C, D**
Civil Rights Movements in the United States
A study of the politics of civil rights and the various philosophical approaches that have been used to extend such rights to groups that have traditionally had no access to the agenda setting processes within the legislative system. Emphasis is placed on the philosophy of nonviolence and on the political effectiveness of such organizing strategies as marches, sit-ins, and public demonstrations; and how the American experience with civil rights has influenced civil rights movements in other parts of the world. Cross-listed as AAS 306; LST 306.

PSC 311 three credits
State Politics
Prerequisites: PSC 101 and upper-division standing
An exploration of politics and government in the American states. The course is a comparative analysis of the 50 states, although special attention will be given to Massachusetts.

PSC 312 three credits
Massachusetts Politics
Prerequisites: PSC 101 or consent of instructor and upper-division standing
An analysis of selected aspects of Massachusetts politics and government: the state legislature, electoral trends, parties, courts, and executive policy are potential subjects. There will be a special emphasis on student research.

PSC 313 three credits **D**
Urban Politics
Prerequisites: PSC 101 and upper-division standing
A critical examination of the urban political community in the United States. Particular attention is given to the adequacy of the city as an arena of conflict resolution and decision-making as well as such current problems as urban reconstruction in the ghettos. Field research in the area by individuals or groups is encouraged but not required. Cross-listed as AAS 313.

PSC 315 three credits
Public Policy in America
Prerequisites: PSC 101 and upper-division standing
The policy-making roles, processes, and dynamics of U.S. political institutions, including the federal bureaucracy, media, think tanks, and universities. Major theme and dynamics examined include: governmental secrecy, covert action, the role of scientific experts, and the right to privacy.

PSC 320 three credits
American Political Thought I
American political thought from the Revolution to the Civil War with particular emphasis on ideas of state-building and political economy. Readings may vary, but will likely include the Declaration of Independence, early state constitutions, the Articles of Confederation, The U.S. Constitution, The Federalist, selections from the Jacksonian democrats, and articles by George Fitzhugh.

PSC 321 three credits
American Political Thought II
American political thought from the end of Reconstruction to the New Deal, with particular emphasis on ideas of state-building and political economy. Readings may vary but will likely include William Graham Sumner, selected American Socialists, J. Allen Smith, and Herbert Croly.

PSC 322 three credits **O, W**
Constitutional Law
Prerequisites: PSC 101 and upper-division standing
Course centers on the development of the constitutional framework of American government. Supreme Court cases will cover judicial review, the powers of the three branches, and federalism.

PSC 323 three credits **E**
Civil Liberties
Prerequisites: PSC 101 and upper-division standing.
In effect the second half of the course on Constitutional Law. The Civil Liberties course deals with the relations between the individual and the state as defined by U.S. Supreme Court decisions. Topics may include rights of racial minorities, freedom of speech, church-state relations, and the rights of criminal defendants.

PSC 326 three credits
Labor Relations:
Law, Practice, and Policy
An examination of the political and legal framework of U.S. labor relations.
The course will include analysis of legislation and Supreme Court and NLRB cases which shape national labor policy and define relations among workers, employers, and the state. Cross-listed as LST 326.

PSC 331 three credits
Political Parties and Interest Groups
Prerequisites: PSC 101 or written permission of instructor; and upper-division standing
The development and function of political parties and political interest groups in American politics. Strategies for lobbying and for creating interest groups also examined. Cross-listed as LST 332.

PSC 332 three credits
Sex Roles and Politics
Prerequisites: PSC 101 or PSC 238 or WMS 100, and upper-division standing
An examination of the impact of gender as a variable in American politics. The course analyzes women in the electorate as candidates, as office holders, and as political participants including participation in political organizations and lobbying groups. Cross-listed as WMS 332.

PSC 333 three credits
Political Behavior
Prerequisites: PSC 101 or PSC 238 and PSC 349, or written permission of instructor; and upper-division standing
Examines political behavior within the American political system. Special emphasis on quantitative methods to examine participation. Original data sets which have provided the sources for assigned readings are supplied. Emphasis on socio-economic models of participation.

PSC 339 three credits **D**
Women and Public Policy
Prerequisites: PSC 101 and upper-division standing
Examines public policies and landmark Supreme Court opinions relating to gender equality and women's interests in the United States. Topics may include educational policies, employment policies, child care policies, health care policies, reproductive rights, and policies relating to women as criminals. Cross-listed as WMS 339.

PSC 341 three credits
Governmental Secrecy
Prerequisite: PSC 101
A survey of the political issues and policies relating to the federal secrecy system and the individual agencies within it, such as the CIA, FBI, Pentagon, and National Security Agency. Major topic areas include classification and declassification systems, rights to privacy, national secrecy, and proposed changes and reforms. The balance between secrecy and the public right to know in a democratic system is a primary focus, and legal processes for citizens to obtain information are explored. Freedom of Information Act, Privacy Act, administrative and legal challenges to government withholding of information regarding both individual files and topics concerning political/historical events.

PSC 342 three credits
Public Administration
Prerequisites: PSC 101 and upper-division standing
Examination of the general nature of the bureaucracy in public and private organization and in various cultural contexts. Attention is given to administrative responsibility. Cross-listed as LST 342.

PSC 347 three credits
Environmental Law
Prerequisite: Upper-division standing
An introduction to basic concepts of environmental law. The emphasis is on broad introductory themes.

PSC 349 three credits
Political Science Research Methods
Prerequisites: PSC 101, 151, or 161, or permission of instructor; and upper-division standing
An introduction to the various subfields of

political science from a practitioner's point of view. Students will learn how to study politics "scientifically" using theories, hypotheses, and concepts to explore the relationships among variables. Students will also learn how to define and critique concepts commonly used in professional journals. The course concludes with an overview of descriptive statistics and their application to data analysis within a Political Science framework.

PSC 351 three credits
Modern Political Thought
Prerequisite: Upper-division standing
European political theorists from the 16th through 19th centuries. Course will focus on the development of modern liberalism with some attention to its nineteenth century critics. Readings may vary, but most likely will include the major political writings of Hobbes, Locke, Rousseau, and Bentham.

PSC 352 three credits
Classical Political Thought
Prerequisite: Upper-division standing
European political theorists from ancient Greece through the 15th century. Readings may vary, but most likely will include the major political writings of Plato, Aristotle, St. Augustine, and others.

PSC 353 three credits **G**
Non-Western Political Thought
Prerequisite: Upper-division standing
The political philosophy of non-western thinkers whose ideas had a deep impact on the political institutions in lands outside Europe. Emphasis is on Buddhist, Hindu and Muslim thinkers who at different periods of history gave insightful expositions of human nature in politics.

PSC 354 three credits
Contemporary Political Thought
Prerequisite: Upper-division standing
The recent ideological currents in advanced capitalist societies: neo-conservatism, neo-liberalism, syndicalism, postmarxian socialism, eco-anarchism, and corporate fascism. The course will focus on political thinkers who have made significant contributions to the interpretation of contemporary political and economic developments.

PSC 357 three credits
Marxian Political Theory
Prerequisite: PSC 201 or 204, ECO 232, SOC 200; or permission of the instructor
The basic concepts of 'Radical' political economy. Course will include an in-depth analysis of Marx's *Capital*, Vol. I, as well as a survey of current trends in the development of a critical theory of the state. Cross-listed as LST 357.

PSC 360 three credits **G**
Politics and Governments of Western Europe
Prerequisite: PSC 151 or upper-division standing
The political culture, historical political development, and governmental institutions of major Western European nations, including the European Union. The course will focus on Britain, France, Germany, and Italy.

PSC 361 three credits
Chinese Government and Politics
Prerequisites: PSC 151 and upper-division standing
An introduction to the People's Republic of China and its political process. The interrelationships between China's revolutionary heritage and the development of Maoist ideology and mass mobilization politics, economic policy, and foreign policy will be examined. Finally, post-Mao politics will be studied to determine the degree and direction of change and its implication for Chinese politics and for the Chinese people.

PSC 363 three credits **C, G**
Politics and Government of the Middle East
Prerequisite: Upper-division standing
The politics of the Middle East in terms of the region's history, geography, culture and the impact of the West. Country studies include Turkey, Egypt, Syria, Israel, Jordan, Iraq, Saudi Arabia, and other Gulf States.

PSC 366 three credits **C, G**
Islam and Politics
The political and cultural history of Islam. Students will learn about the contemporary revolutionary religious movements in Muslim countries and their effect on world politics.

PSC 367 three credits **C, D, G**
African Political Systems
A study of the contemporary politics of African states and governments, and providing exposure to the African historical backgrounds, political cultures, political trends, and ideology. The colonial heritage of African states, the quest for modernization and nation-building, and the transition to democratic governance are explored. Cross-listed as AAS 367.

PSC 368 three credits **G, W**
Politics of the Post Communist World
Prerequisites: PSC 151 or permission of the instructor, and upper-division standing
Examination of the factors which led to the demise of the former Soviet Union as well as the politics of transition during the post-Soviet period including the relationships between political and economic change, institution building, and state capability, and the evolution of new sources of political legitimacy.

PSC 369 three credits
Transitions to Democracy
Transitions from non-democratic to democratic regimes in three major areas of the world, Southern Europe, the Soviet Union and East-Central Europe, and South America, from a comparative theoretical perspective. Theoretical problems include what democracy is and is not, democratic transition and democratic consolidation, how and why transitions to democracy have occurred, and factors that influence the success or failure of democratization.

PSC 381 three credits
Contemporary International Relations
Prerequisite: Upper-division standing
Problems in international relations with emphasis on changing characteristics of contemporary world politics. Attention is given to super-power politics and accommodations (detente) in Europe, East Asia, the Middle East, and Africa, and the problems associated with the emergence of a new world order.

PSC 382 three credits
American Foreign Policy
Prerequisite: PSC 161 or permission of the instructor
Policy choices made by the United States and the actors, institutions, and influences that affect those decisions. Students gain an understanding of the foreign policy positions of presidential candidates and presidents, the various influences on the making of American foreign policy and the American foreign policy process, and the impact of the changing international environment on American foreign policy.

PSC 383 three credits **G, W**
The Politics of International Economic Relations
Prerequisites: PSC 151 or PSC 161 or permission of instructor, and upper-division standing
Examination of the politics and impact of international economic issues globally,

including how international economic policies are made, their differential impact on industrialized and less-industrialized countries, and the evolution and behavior of important actors in the global economy (governments, international organizations, NGOs).

PSC 385 three credits
Multiculturalism and Diplomacy in World Affairs
Prerequisites: PSC 151, 161
Diplomacy, negotiation, and foreign policy decision-making. Students will learn the theory of negotiation from structured student-participation discussions. Students then participate in a multi-university, multi-national foreign policy web-based simulation exercise that helps illustrate the problems and possibilities of international interactions, in which students negotiate with other "state" diplomats to achieve foreign policy goals concerning such issues as drug trafficking, terrorism, human rights, world health, the environment, and debt and development.

PSC 386 three credits
International Conflict
Prerequisite: PSC 161
Analysis of the causes of and state responses to international conflict and violence. A particular emphasis is placed on ethnic conflict, managing conflict, and the future of international conflict. Can conflict be minimized or controlled? Is our world more or less safe than it was before? Are we heading toward a World War III?

PSC 393 three credits **G**
Portugal and the European Union
Prerequisite: sophomore standing or above
Examines the political, economic, and demographic shifts in Portuguese society that have accompanied the process of European integration. This is a four-week summer course offered in a study-abroad format in Portugal. Various field trips and guest lectures will shed light on the impact of EU integration.

PSC 394 three credits **G**
The Politics of European Integration
Prerequisite: sophomore standing or above
Topics on European integration, the historical development of the European Union, eastward expansion, treaties, the Single Market, the EURO, theories of European integration, and challenges facing small states in the EU. This is a four-week summer course offered in a study-abroad format in Portugal. Various field trips and guest lectures will shed light on the impact of EU integration.

PSC 395 three credits **G**
Politics and Development of Modern Portugal
The politics and economic development of 20th century Portugal. This course will explore the links between changes in the socio-economic structures of the country and the transformation of the political system. Portuguese colonialism, the corporatist Estado Novo, and the transition to and consolidation of democracy will be examined from a comparative European perspective.

PSC 400-449 three credits
Seminars in American Politics and Ideas

Recently offered seminars include:

PSC 401 three credits **O**
Seminar: American Presidency

PSC 403 three credits
Seminar: The Corporate State

PSC 405 three credits
Seminar: Sports and Politics

PSC 407 three credits
Seminar: Identity Politics

PSC 408 three credits
Seminar: Judicial Process

PSC 409 three credits
Seminar: Campaigns and Elections

PSC 412 three credits
Seminar: Contemporary American Political Ideas

PSC 444 three credits
Seminar: Politics of Assassination

PSC 445 three credits
Research Seminar in American Politics and Ideas

PSC 450-494 three credits
Seminars in World Politics and Ideas

Recently offered seminars include:

PSC 451 three credits **G**
Seminar: Politics of Developing Countries

PSC 456 three credits
Seminar: Globalization

PSC 477 three credits
Research Seminar: African Political Systems

PSC 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

PSC 196, 296, 396, 496 variable credit
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered
Conditions and hours to be arranged.

PSC 499 variable credit
Thesis
Undergraduate thesis under the supervision of a faculty member, by arrangement.

Course for the Master of Arts in Teaching

PSC 501 three credits
Teaching Political Science in Secondary Schools
Analysis of the policy-making process, particularly in contemporary American national, state and local politics; comparative analysis of other political systems; development of issue oriented case studies and units for use in secondary school social studies courses; development of critical thinking and communications skills.

Portuguese

The Department offers a solid foundation in the study of Portuguese, the sixth most spoken language in the world. A three-tier program introduces students to the rich cultural diversity of the Portuguese-speaking world, composed of 200 million people in eight countries on four continents. In addition to the regular academic year program, the Department of Portuguese offers a comprehensive Summer Program in Portuguese that attracts students from throughout the United States, with intensive courses in Portuguese language and Lusophone Literatures and Cultures.

There are a number of resources available to students of Portuguese. The University has a state of the art language laboratory that houses multimedia educational resources, allowing for learning beyond regular class hours. Located in the heart of the region that boasts the largest concentration of Portuguese, Cape Verdeans, Brazilians, and their descendents in North America, the University of Massachusetts Dartmouth provides a unique environment for the learning of Portuguese in a thorough immersion setting.

Department of Portuguese offerings are supplemented by the activities of the Center for Portuguese Studies and Culture. The Center organizes a variety of cultural events throughout the year, including lectures, exhibitions, concerts and colloquia. The Center also publishes three book series and a semiannual academic journal entitled *Portuguese Literary & Cultural Studies*.

Faculty and Fields of Interest

Dário Borim Portuguese language and Brazilian cultural discourse

Anna Klobucka (chairperson) Portuguese and Lusophone African literatures and pedagogy

Victor Mendes Portuguese literature, critical theory

Frank Sousa 19th and 20th centrury Portuguese and Brazilian fiction

Sandra Sousa (Camões Institute Lecturer) Portuguese language

Portuguese Major
BA degree

Requirements

Students may declare a Portuguese Major at any time during their academic career, including at the time of admission to the University as an incoming freshman or transfer student. It is possible for students to start Portuguese at UMass Dartmouth and become majors by taking intensive language courses either during the academic year or during the Summer Program in Portuguese. Majors are required to complete a minimum of 33 credits of Portuguese course work at the 300- and 400-level. A grade point average of 2.0 in Portuguese courses is required for graduation. Students are strongly encouraged to take elective courses in art history, history, political science, and anthropology/sociology related to Brazil, Cape Verde, and Portugal.

Upon completion of the major, students are expected to speak fluently, write effectively and read critically in Portuguese. A degree in Portuguese offers access to careers in education, translation, business, international relations, print and visual media, social and non-profit/non-governmental organizations, and politics, among other fields.

Portuguese Major
BA degree

Requirements

		credits
POR 301, 302	Portuguese Grammar and Composition I and II	6
POR 310	Introduction to Literary and Cultural Analysis	3
POR 331, 332, 333, 334	Three of these four	9
POR	Five additional courses at the 300- or 400-level, two of which must be at the 400 level	15
	Total	**33**

General Education Departmental Requirements

Students majoring in Portuguese will meet their departmentally-controlled General Education requirements as follows:

Area E: Satisfied by PHL 101 or 215 (advisor may approve using another course from the approved list)
Area I, Tier 2: Satisfied by POR 301 and 302 (subject to Gen Ed Committee approval)
Area W, Tier 2: Satisfied by POR 301 and 302 (subject to Gen Ed Committee approval)
Area O: Satisfied by two 400-level POR courses (subject to Gen Ed Committee approval)

Other Program Information

Study Abroad Program
The Department of Portuguese strongly encourages students to study at a Portuguese or Brazilian university for at least a semester.

Phi Lambda Beta (National Portuguese Honor Society)
Students who have 18 credits in college-level Portuguese (including at least one course in literature or culture), a minimum 3.0 cumulative GPA, and a 3.5 GPA in Portuguese courses are eligible for membership. For further information please contact the Department.

Teacher Certification in Portuguese
Portuguese majors with a 3.0 cumulative average in their major may apply for admission to the University's Teacher Certification Program. Students seeking middle and secondary certification take POR 321 Teaching Portuguese as a Foreign Language and any one of the following courses offered by the Department of Foreign Literature and Languages: FLL 322, FLL 324, FLL 326, in addition to the required courses offered by the Education Department. For further information, contact the Education Department.

Student Placement Exams
Students who have formally studied Portuguese at the high school or college level, or are heritage speakers, are encouraged to take a placement exam to determine the appropriate level to begin studying Portuguese at UMass Dartmouth. Students should contact the Department for information about examination schedule.

Scholarships
The Department of Portuguese offers a limited number of undergraduate and graduate scholarships based on academic qualifications and financial need

Tuition Reduction
The Portuguese program qualifies under the New England Regional Student Program to allow non-Massachusetts resident students from the other new England states to pay a substantially reduced non-resident tuition. See the chapters on Expenses and Admissions for details

Minor in Portuguese

Minors in Portuguese develop a strong foundation in the language and receive a thorough introduction to the cultures of the Portuguese-speaking world that will complement any major.

Students must have 54 credits and a cumulative GPA of 2.0 and a 2.5 in their major field to declare a minor in Portuguese. Minors in Portuguese must complete 18 credits (refer to chart below for specific requirements).

		credits
POR 301, 302	Portuguese Grammar and Composition I and II	6
POR	Two additional courses at the 300-or 400-level	6
POR	Any two courses in Portuguese	6
	Total	**18**

Gen Ed Note: All Portuguese courses satisfy area **C**, Cultural and Artistic Literacy. Some courses satisfy other requirements, as noted.

Portuguese Courses

POR 101 three credits **G**
Elementary Portuguese I
3 hours lecture, 1 hour laboratory
Introduction to the foundations of the Portuguese language for students who have little or no knowledge of Portuguese. Students develop listening comprehension, speaking, reading, and writing skills. The course offers regular presentation of music and slides/websites depicting everyday life in Portuguese-speaking countries.

POR 102 three credits **G**
Elementary Portuguese II
3 hours lecture, 1 hour laboratory
Prerequisite: POR 101 or equivalent
Continuation of POR 101. Short readings on contemporary life in Portuguese-speaking countries will be introduced.

POR 103 six credits **G**
Intensive Elementary Portuguese
An intensive course designed for beginners who desire to master the basic structures and vocabulary of the language in one semester; students complete a year of language in one semester. Students learn in a communicative environment using all four of the language skills: listening, speaking, reading, and writing. This course is equivalent to POR 101 and 102.

POR 201 three credits **G**
Intermediate Portuguese I
3 hours lecture, 1 hour laboratory
Prerequisite: POR 102 or equivalent
Continuation of Portuguese for students who have had a solid introduction to the Portuguese language. In addition to focusing on grammatical concepts and conversation, new vocabulary will be introduced. Greater emphasis will be given to writing. Readings include short stories, newspaper and magazine articles, and poetry. There will also be a more intensive look at topics of relevance to the Portuguese-speaking world, including aspects of social and cultural interest.

POR 202 three credits **G**
Intermediate Portuguese II
3 hours lecture, 1 hour laboratory
Prerequisite: POR 201 or equivalent
Continuation of POR 201.

POR 203 six credits **G**
Intensive Intermediate Portuguese
An intensive intermediate Portuguese language course. This course is designed to review the grammar and syntax of the Portuguese language studied in the first year, stressing usage and accuracy in all four language skills and emphasizing the expansion of vocabulary and use of Portuguese practical situations. Students complete a year of language in one semester. This course is equivalent to POR 101 and 102. (Formerly offered as POR 200.)

POR 214 three credits **G**
Portuguese Literature in Translation
Prerequisite: ENL 102
Outstanding works of Portuguese literature and culture, with readings, lectures, and discussions in English. (Formerly offered as POR 203.)

POR 215 three credits **G**
Brazilian Literature in Translation
Prerequisite: ENL 102
Outstanding works of Brazilian literature and culture, with readings, lectures, and discussions in English. (Formerly offered as POR 204.)

POR 216 three credits **G**
Lusophone African Literatures in Translation
Prerequisite: ENL 102
Outstanding works of Cape Verdean, Angolan, and Mozambican literatures and cultures, with readings, lectures, and discussions in English.

POR 270 three credits **G**
Music and Cinema of Brazil (in English)
A panoramic view of the ethnically diverse Brazil through music and cinema. Topics fostering global awareness and artistic literacy include the international reception of Cinema Novo and post-Cinema Novo, as well as bossa nova, samba, Tropicália and new fusions of world music. Social and historical perspectives on racial and regional diversity are explored. Materials and discussions are in English.

POR 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Students receive academic credit for work experience, with the Portuguese language in its written and spoken form as a focus in the work conducted. A faculty member who is in the field will oversee the work and arrange conditions and hours with the student. Graded CR/NC. For specific procedures and regulations, see section of catalogue on "Other Learning Experiences."

POR 301 three credits **G**
Portuguese Composition and Conversation I
Prerequisite: POR 202, or equivalent
Designed to expand the student's vocabulary considerably, while providing an in-depth review of Portuguese grammar. The goal is for the student to achieve overall language proficiency. The readings will focus on short stories from the diverse Portuguese-speaking world. Compositions on a variety of topics will be assigned weekly. This course is conducted entirely in Portuguese.

POR 302 three credits **G**
Portuguese Composition and Conversation II
Prerequisite: POR 301
Continuation of POR 301.

POR 305 three credits
Introduction to Translation and Business Portuguese I
Prerequisites: POR 302; or consent of instructor
Introduction to translation theory and techniques. A number of texts from a variety of genres, including essay, short stories, and journalistic texts, will be distributed to students for translation. Students will present portions of their translated text to the class for comment. A portion of the course will also be dedicated to the fundamental terms of business correspondence in Portuguese. (Formerly offered as POR 337.)

POR 306 three credits
Introduction to Translation and Business Portuguese II
Prerequisites: POR 305; or consent of instructor
Continuation of POR 305. (Formerly offered as POR 338.)

POR 308 three credits **G**
Advanced Grammar and Syntax
Prerequisite: POR 202 or equivalent
Study of Portuguese grammar and its uses, with extensive exercises. Emphasis will be placed on particular topics in Portuguese grammar and on advanced writing skills to be complemented by readings from Brazilian, Cape Verdean, Portuguese and Lusophone literatures. (Formerly offered as POR 325.)

POR 310 three credits
Introduction to Literary and Cultural Analysis
Prerequisite: POR 302 or consent of instructor
A study of fundamental issues underlying

literary and cultural analysis, and methodological backgrounds of critical strategies. The course will explore theory from Aristotle to contemporary critical schools like Marxism, Feminism, Deconstruction, New Historicism, and Cultural Criticism. Samples from some of the major genres and works of the Portuguese-speaking world are analyzed. Students write several short papers.

POR 312 three credits **G**
Culture and Civilization of Portugal
Prerequisite: POR 302 or consent of instructor
Introduction to the cultural development of the Portuguese people throughout history. Lectures, class discussions, written and oral reports on significant aspects of Portuguese literary, social and artistic life.

POR 314 three credits **G**
Culture and Civilization of Brazil
Prerequisite: POR 302 or consent of instructor
The development of Brazil and its people from the colonial period to the present. Films, documentaries, textbooks and music studied through lectures, computerized instruction, in-class discussions, plus written and oral reports on significant aspects of Brazilian literary, social, political, economic, and artistic life.

POR 321 three credits
Teaching Portuguese as a Foreign Language
Prerequisite: POR 302 or consent of instructor
A theoretical and practical survey of methods and techniques used to teach foreign languages designed principally for preservice teachers in K-12 Portuguese language education. Development of educational materials for Portuguese and methodological issues applicable to heritage language learners are particularly emphasized. Assignments include presentations of teaching modules, classroom observations and preparation of professional portfolios.

POR 331 three credits **G**
Introduction to Portuguese Literature I
Prerequisite: POR 302 or equivalent
Survey of Portugal's most significant works from the medieval lyric to the chronicles of Fernão Lopes, the theatre of Gil Vicente, the poetry of Luís de Camões, and the sermons of Padre António Vieira. The objective of this course is to introduce students to the critical reading of complex Portuguese texts.

POR 332 three credits **G**
Introduction to Portuguese Literature II
Prerequisite: POR 331 or consent of instructor
Continuation of POR 331, covering Portuguese literature from Romanticism to the present. Attention will be given to literary history and criticism.

POR 333 three credits **G**
Introduction to Brazilian Literature I
Prerequisite: POR 302 or equivalent
Survey of the development of Brazilian literature from the colonial period to the nineteenth century. Attention is given to literary history and criticism.

POR 334 three credits **G**
Introduction to Brazilian Literature II
Prerequisite: POR 333 or consent of instructor
Continuation of POR 333. A survey of twentieth century Brazilian literature. Emphasis on major authors and literary periods. Attention is given to literary history and criticism.

POR 335 three credits **G**
Introduction to Lusophone African Literatures
Prerequisites: POR 302 or consent of instructor
Survey of representative literary texts (poems, novels, and short stories) by twentieth-century Lusophone African writers. Readings range from early landmarks of emergent national literatures of Angola, Cape Verde, and Mozambique to recent works whose authors "came of age" in the post-independence period (after 1975). Literary works are discussed in the context of significant cultural, social, and political aspects of contemporary Lusophone Africa.

POR 350 three credits **G**
The Classical Period
Prerequisites: POR 331, 332; or consent of instructor
The prose, poetry, and theater of sixteenth century Portugal, including literature related to the Portuguese Expansion. (Formerly offered as POR 445.)

POR 360 three credits **G**
Nineteenth Century Portuguese Literature
Prerequisites: POR 331, 332; or consent of instructor
Study of the major authors and literary movements of the nineteenth century including works of Almeida Garrett, Alexandre Herculano, Camilo Castelo Branco, Antero de Quental, Eça de Queirós, and Cesário Verde among others. (Formerly offered as POR 455.)

POR 361 three credits **G**
Twentieth Century Portuguese Literature
Prerequisites: POR 331, 332; or consent of instructor
Study of the major literary authors and movements of the twentieth century including readings from Fernando Pessoa, Carlos de Oliveira, Jorge de Sena, Vergílio Ferreira, Agustina Bessa Luís, José Cardoso Pires, and José Saramago, among others. (Formerly offered as POR 456.)

POR 370 three credits **G**
Music and Cinema of Brazil
Prerequisites: POR 333, 334; or consent of instructor
A panoramic view of the music and cinema of Brazil. Regionally and aesthetically diverse songs and films composes the corpus of this course. Topics include bossa nova, samba, tropicalismo, Cinema Novo, and post-Cinema Novo. Representations taken from myths, mysteries, fantasies, and traditions are studied from social and historical perspectives.

POR 380 three credits **G**
Modern Brazilian Theater
Prerequisites: POR 333, 334; or consent of instructor
Panoramic view of the history of Brazilian theater from the 1500s to the 1990s, with a focus on the country's greatest dramatist, Nelson Rodrigues. Discussions will include issues related to urban culture ad aesthetic innovations.

POR 400 three credits
Luís de Camões
Prerequisites: POR 331, 332; or consent of instructor
This course consists of two parts. First, students analyze the types of lyrical poetry Camões wrote—traditional peninsular forms and those taken from the Renaissance—and study the recurring themes in Camões. Second, we study the epic poem, *The Lusiads*. Attention is given to the influence of Camões in Portuguese culture. (Formerly offered as POR 446.)

POR 410 three credits
Eça de Queirós
Prerequisites: POR 331, 332; or consent of instructor
Study of the major works of the foremost

Portuguese novelist of the nineteenth century. Examination of the aesthetic and ideological significance of Eça's works. The analysis of his works as a critical response to European literature and philosophy, and specific authors of the Portuguese and Spanish tradition. Discussion of themes such as the relation between nature and culture, language and reality, technology and man, the past and historiography, and Portuguese nineteenth century society.

POR 420 three credits **G**
Machado de Assis
Prerequisites: POR 333, 334; or consent of instructor
Study of the major novels and short stories of the foremost Brazilian author of the nineteenth century. The course examines the innovative narrative techniques that characterize his works, and their relationship to precursors such as Lawrence Sterne and Almeida Garrett. The course also explores how Machado's skepticism and irony anticipates modernist and post-modernist writings.

POR 430 three credits **G**
Fernando Pessoa and Twentieth Century Portuguese Poetry
Prerequisites: POR 331, 332; or consent of instructor
Study of the poetry of Fernando Pessoa as an example of Modernism. The course examines the major heteronyms and their significance and discusses subsequent Portuguese literary generations of the 20th Century, their characteristics, and most important authors, with emphasis on poetry.

POR 481 three credits **G**
Seminar in Portuguese
Prerequisites: POR 332, 334; or consent of instructor
The study of a specific topic, author, or literary period from Portugal, Brazil and/or Lusophone Africa. May be repeated with change in content.

POR 495 three credits
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean.
Intensive study or research on a specific topic in Portuguese, Brazilian or Lusophone African studies under the direction of faculty member. Conditions and hours to be arranged.

POR 496 three credits
Directed Study
Prerequisites: Permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently offered. Conditions and hours to be arranged.

Graduate Courses in Portuguese

POR 530 three credits
Fernando Pessoa and Twentieth Century Portuguese Poetry
See POR 430.

For the Master of Arts in Teaching program, appropriate 400 level Portuguese courses may be offered at the 500 level.

Psychology

Psychology Major
BA degree

Faculty and Fields of Interest

The focus of psychology is the scientific study of behavior. Psychology is studied as a science with the implication that there is a commitment to rational thinking and empirical analysis of the problems encountered in describing and explaining human behavior.

A three-course core sequence introduces students to the way in which psychology as a field advances through scientific research. A wide range of subfields of psychology are offered through courses that emphasize our biological heritage (e.g., physiological psychology, perception) to those that examine basic human functioning (e.g., cognition, learning, personality, social) and those that have a distinct applied orientation (e.g., counseling, behavior modification, organizational, and community psychology).

There are also opportunities for students to engage in independent research and honors research projects and to participate in internships in various clinical settings. The curriculum can be structured to prepare students for graduate education or to include applied clinical coursework and experiences that would allow graduates to seek employment in a variety of human services agencies.

Students who major in psychology find primary employment opportunities in personnel management, elementary and secondary high school education, social work, software and other product development. Higher level psychological activities, such as counseling psychotherapy, university instruction, psychological research (in industry, universities, and research centers) and various administrative mental health positions generally require a master's degree or preferably a doctorate in psychology.

The department also offers a graduate program in psychology leading to a master of arts degree, with distinct clinical and research options.

Victor P. Caliri counseling and organizational psychology, humanistic and health psychology, psychology of religion

John K. Conboy child and family psychotherapy, psychological assessment, sports psychology, child neuropsychology counseling

Donald Corriveau clinical research, counseling, behavioral medicine

Paul A. Donnelly counseling psychology, treatment of adolescent and criminal offenders

Susan Norstrom developmental psychology, gender development

Morton H. Elfenbein social psychology, group and organizational behavior, evaluation research, epistemology

Barry R. Haimson psychophysiology and perception

Mahzad Hojjat social psychology, multicultural psychology

William R. Holt general psychology, behavioral and quantitative psychology, developmental psychology

Theodore A. Powers clinical training, personality disorders, online counseling

James B. Riley (chairperson) behavior modification and community psychology

Amy M. Shapiro (on leave) human learning and memory, educational technology, and psycholinguistics

Judith E. Sims-Knight cognitive and developmental psychology, human-computer interaction

GPA Requirements

The Psychology Department has a GPA requirement that varies with the number of credit hours completed (see below) Failure to maintain the minimum cumulative grade point average will mean Departmental Probation. In the semester following one in which the student's GPA is below the minimum, the student will not be allowed to register for courses designated for psychology majors only

Number of credit hours/GPA	
30 / 2.00	50 / 2.750

A student who receives three or more grades of "W" or "I" in a semester will be placed on Departmental Probation After two consecutive semesters of Departmental Probation, students may be disenrolled from the major.

Major Requirements

Psychology majors must fulfill requirements listed below Students must have a C- or better in any psychology course taken to meet the requirements listed in the Required Courses and the Area Requirements, including Area 5 PSY electives

All psychology majors are required to complete successfully General Psychology (PSY 101), Statistics (PSY 205), and Experimental Methods (PSY 210). In addition 21 credits must be taken among the five areas listed in the requirements section This system is designed to provide students with a broad liberal education in the field Students should plan to complete General, Statistics, Experimental Methods, and their choice from Area 1 (Child or Adolescent Psychology) by the end of sophomore year. Available as electives is a three-course counseling sequence, PSY 406, 407 and 480, which introduces students to some applied aspects of psychology In addition, students interested in research who are considering eventual graduate education in psychology may apply to pursue Honors Research. Both of the above options are available for students interested in pursuing clinical research. Students may also participate in the Cognitive Science Program, the interdisciplinary study of issues of the human mind and its applications to effective design of educational curriculum, computer software, and other products. All Psychology majors are required to participate in the senior year assessment. The purpose of this assessment is to provide an empirical basis for curricular improvement.

Required Courses

	Credits
PSY 101 General Psychology	3
PSY 205 Statistics for Psychology	4
PSY 210 Experimental Methods	4

Area Requirements

Area 1: Choose one of the following:

PSY 201 Child Psychology PSY 215 Adolescent Psychology	3

Area 2: Choose two of the following:

PSY 202 Abnormal Psychology PSY 204 Social Psychology PSY 302 Psychological Testing	6

Area 3: Choose one of the following:

PSY 305 Physiological Psychology PSY 320 Psychology of Perception	3

Area 4: Choose one of the following:

PSY 303 Psychology of Learning PSY 308 Cognitive Processes	3

Area 5: Choose at least two upper-level electives, excluding contract learning:

Psychology electives 300-level and above	6
Total	**32**

Psychology Honors Program

The Psychology Department participates in the university honors program by offering honors sections of general psychology, and it also has a departmental honors program.

The psychology honors program is designed to provide psychology students with the opportunity to engage in independent research. It is recommended for all students who wish to pursue a PhD degree, whether in an experimental or applied area. Honors students typically have GPAs over 3.0, but admission to the honors program is based on overall potential and motivation rather than on grade point average alone.

The sequence begins in the junior year with the identification of a research topic and a faculty advisor. Beginning in their junior year or in the first semester of their senior year honors students carry out an original research project by enrolling in an eight credit honors research seminar.

Combined BA-MA in Psychology

This fast-track program enables qualified BA degree students in psychology to complete both the BA and the MA in Psychology, General Option, in 5 rather than 6 years.

Eligibility
Students may apply to the combined program as entering freshmen or as undergraduates during their sophomore or junior years. Successful candidates will have an overall GPA of at least 3.25, B or better in PSY 205 and PSY 210, at least one recommendation from a research psychologist, and a well-written personal essay that reveals their potential for a research career. Application should be made to the Graduate Program Director for the General Option, who will make a recommendation to the department chairperson.

Progression to MA Study
Students will take four graduate courses as senior year electives that will also apply toward the MA degree (12 credits). The department will provide a specific list of courses and how they fit within a recommended sequence. During the senior year, the student will file a Psychology General Option MS application in the Office of Graduate Studies.

Tuition and Fees
Students pay tuition and fee rates as published by the university. Students selecting the BA-MA option will pay undergraduate rates until they reach the level of completion of the baccalaureate degree.

General Education Departmental Requirements

Students majoring in Psychology will meet their departmentally-controlled General Education requirements as follows:

Area E: Satisfied by three of the following: PSY 101, 202, 204, 210, 302, 406, 490
Area I, Tier 2: Satisfied by PSY 205
Area W, Tier 2: Satisfied by PSY 210
Area O: Satisfied by PSY 210, 490 (both must be taken)

Psychology Courses

PSY 101 three credits
General Psychology
A broad survey of principles underlying the systematic study of behavior. Using examples from basic research and applied settings, a variety of perspectives are explored, including findings associated with the physiological, behavioral, cognitive, developmental and social approaches.

PSY 201 three credits
Child Psychology
Prerequisite: PSY 101
A study of the child from both the developmental and experimental approaches. Topics that may be included are methodology in child research, heredity and environment controversy, intelligence, language and communication, learning in infancy and childhood, and motor, cognitive, perceptual, personality, and social development. This course meets the Massachusetts Office for Children requirement for day care center certification, OFC Category A, Child Growth and Development.

PSY 202 three credits
Abnormal Psychology
Prerequisite: PSY 101
Study of development and characteristics of behavior disorders. Topics to be considered include: cause of abnormal behavior, transient personality reaction to acute or special stress, psychoneurotic disorders, and therapeutic measures.

PSY 204 three credits **G**
Social Psychology
Prerequisite: PSY 101
The study of experimental findings, theoretical and methodological issues in understanding the individual in a social context.

PSY 205 four credits **W**
Statistics for Psychology
Prerequisite: PSY 101
An introduction to analysis of quantitative data in psychology, including probability, descriptive statistics, correlation and regression, analysis of variance and data analysis by computer.

PSY 210 four credits **W, O**
Research Methods
Prerequisites: PSY 101, 205
An introduction to the design, administration and analysis of psychology experiments, and other types of research including computer applications. Emphasis also on evaluation of research and scientific report writing

PSY 215 three credits
Adolescent Psychology
Prerequisite: PSY 101
A survey of theories of adolescent personality development, psychopathology and current issues in the field.

PSY 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

PSY 301 three credits
Psychology of Adulthood and Aging
Prerequisites: PSY 101, 201 or 215
A study of normative adult life transformations and crises within the context of cultural diversity and empowerment. Students will investigate culture, gender, and ethnicity patterns. Topics include methodology; developmental theories of adulthood; physical and cognitive changes in adulthood; changing societal, familial, and occupational roles in adulthood; changes in personality and responses to stress in adult lives; and dying as the final stage of development.

PSY 302 three credits
Psychological Testing
Prerequisites: PSY 101, 205
An introduction to basic principles and techniques of psychological testing, and a study of the major types of tests.

PSY 303 three credits
Psychology of Learning
Prerequisites: PSY 101, 205, 210
A survey of learning principles from simple conditioning to complex creative behavior.

PSY 305 three credits
Physiological Psychology
Prerequisites: PSY 101, 205, 210; basic biology recommended
The study of the biological basis of behavior. Course covers basic principles of neurophysiology, neuroanatomy, neuropharmacology. This course also covers biological bases of abnormal behavior, drug addiction, visual processing and sleep mechanisms.

PSY 308 three credits
Cognitive Processes
Prerequisites: PSY 101, 205, 210
A history of cognitive science as a discipline. Topics such as human learning, memory, perception, language, and attention are reviewed. Theories and research on mental processes underlying these behaviors and biological underpinnings and real-life application of these topics are studied

PSY 312 three credits
Organizational Behavior
Prerequisite: PSY 101
A review of historical and current psychological theories and empirical data concerning organizational behavior through lectures and experiential learning groups.

PSY 320 three credits
Psychology of Perception
Prerequisites: PSY 101, 205, 210, basic biology recommended
An overview of research methods and results in the area of perception. Special emphasis on role of stimulus variables and attention on the perceptual constancies, color, size, form, and space perception

PSY 323 three credits
Psychology of Adjustment
Prerequisites: PSY 101, 202, junior standing
A study of the ways in which people adjust to the complex problems of mental health and behavioral dysfunction. The emphasis is on psychosocial models and developmental perspectives rather than medical disease models. Psychoanalytic and behavioral approaches are contrasted with humanistic-existential concepts. Various strategies and approaches for coping with maladaptive and dysfunctional conditions including depression, anxiety, and alcohol and drug abuse are reviewed. This course does not fulfill the upper level psychology requirement for psychology majors.

PSY 330 three credits
Personality Theory
Prerequisites: PSY 101, 202, junior or senior psychology major
Study of personality structure and development through analysis of the theoretical contributions of major personologists

PSY 333 three credits
Psychology in Sports
Prerequisites: PSY 101, 205, 210, or permission of instructor
Investigates behavior in high-level competitive sports and noncompetitive sport activities. Study in the field, which has theoretical, applied and clinical aspects, focuses on athletes, coaches, teams, and spectators.

PSY 370 three credits
Group Dynamics
Prerequisites: PSY 101, 205, 210
Group dynamics as both an experiential activity and an empirical science. This course includes a sensitivity training group.

PSY 375 three credits **E, D**
Psychology of Sex Differences
Prerequisites: PSY 101, 205, 210
Development of sex differences, socialization practices, attitudes, values and role expectations which affect the self-concept and interpersonal relationships. This course is designed to stimulate discussion among men as well as women.

PSY 406 three credits
Counseling I
Prerequisites: PSY 101, 202, 330
Introduction to philosophies, theories and techniques of counseling, and demonstrations of various psychotherapeutic methods. This course is best taken in the spring of the junior year, so students have the option of taking PSY 407 and PSY 480 in sequence in the senior year.

PSY 407 three credits
Counseling II
Prerequisites: PSY 406, and permission of instructor
Continuation of PSY 406, plus tape experiences and supervised practicum experiences.

PSY 409 three credits
Community Psychology
Prerequisites: PSY 101, and any three among PSY 201, 202, 215, 330, 406
A survey of the theories, techniques, and goals of community psychology, particularly as they relate to the community mental health movement.

PSY 416 three credits
Seminar in Psychopathology
The nature of psychopathology as an evolving set of constructs rooted in a matrix of cultural, biological and behavioral variables. Using the American Psychiatric Association's Diagnostic and Statistical Manual (DSM) criteria to define and order groupings of mental disorders, students study a broad range of issues relating to the diagnosis of psychopathological conditions.

PSY 418 three credits
Behavior Modification
Prerequisites: PSY 101, 205, 210, 303
The course begins with a discussion of ethical standards relevant to the modification of human behavior. Psychodynamic theory is reprised to provide a contrasting theoretical perspective to the therapeutic uses of behavior modification techniques. Classical and operant conditioning procedures are reviewed.

PSY 455 three credits
Psychology of Religion
Prerequisites: PSY 101, 202, 330, junior standing; or permission of instructor
Comprehensive multicultural study of the value systems of the major religions (e.g. Judaism, Christianity, Islam) along with the study of other religions and cults and their psychological impact on human behavior. Included is the study of agnosticism and atheism and their influence on the development of human values and behavior. This course consists of lectures, seminar presentations, and research papers.

PSY 480 three credits
Field Work in Counseling Psychology
Prerequisites: PSY 202, 302, 370, 406, 407, and permission of instructor
A practical one day a week assignment in a cooperating state or private mental health facility. Where permitted, students will participate in learning about counseling, interviewing, referral and some evaluation techniques. On-site and departmental supervision is required, with a detailed final report.

PSY 490 variable credits **O, W**
Special Topics in Psychology
Prerequisites: PSY 101, 205, 210, and other upper level courses depending on topic
Advanced seminar usually offered for one semester on a special topic. Check course schedule for special topics seminars. Examples of special topic courses recently offered include: Human-Computer Interaction, Psychopharmacology.

PSY 495 variable credits
Independent Study
Prerequisites: PSY 101, 205, 210 and other upper level courses; and permission of instructor
Students independently pursue an individual research project, under the supervision of a faculty advisor.

PSY 498 four credits
Honors Project I
Prerequisites: PSY 101, 205, 210, appropriate upper-level courses, and permission of faculty advisor and course instructor
The first course in the two-course honors thesis sequence. Students meet weekly with their thesis advisors on an individual basis and weekly as an honors seminar group. During the seminar the honors faculty discuss with the students the general issues of developing a thesis and during the individual meetings with the faculty advisor individual issue and problems are discussed. The goal of this course is to develop a thesis proposal and complete the preparation necessary to conduct the thesis project during the next semester. The optimal time to take this course is the spring of junior year, but it may also be taken in the fall of senior year.

PSY 499 four credits
Honors Project II
Prerequisite: PSY 498
Continuation of PSY 498. The goal of this course is to conduct, analyze, and write up the research described in the thesis proposal. Students will meet regularly with their thesis advisors.

Course for the Master of Arts in Teaching

PSY 609 three credits
Early/Middle Adolescence
Prerequisite: An undergraduate course in child or adolescent psychology or its equivalent
What makes young adolescents distinctly different-such as issues of puberty, conformity, burgeoning intellectual powers. Of particular concern are two issues: (a) evaluating the validity of the research that provides us with our knowledge of them, and (b) exploring how to apply our knowledge to effective practice both in formal and informal settings.

Graduate Courses in Psychology

PSY 501 three credits
Physiology, Psychology, and Psychopharmacology
Advanced study of the physiology of the nervous system and the workings of the brain. Included is a working understanding of psychopharmacology in present day use. Practical application, side effects, and uses of medication in the mental health field today are of specific concern.

PSY 503 three credits
Advanced Psychopathology
Theories of abnormal psychology, in an

advanced study of the major forms of psychopathology. Students will be exposed to the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association). Case studies and therapeutic intervention strategies will be emphasized.

PSY 505 three credits
Research Methods and Design
Prerequisites: A statistics course and permission of instructor
Integrates research design, data analysis, data interpretation, and APA format report writing across the two dominant paradigms in contemporary psychology. The course includes the use of the SPSS statistical software for univariate parametric and some non-parametric models. The course contains a strong experiential component to prepare students for thesis writing.

PSY 506 three credits
Advanced Research Design
Prerequisite: PSY 505 or permission of instructor
In-depth study of statistics in psychological research. Major topics include regression and structural equation models.

PSY 510 three credits
Seminar in Helping Relationships
Prerequisites: Graduate status and permission of instructor
Major approaches to supportive and therapeutic interventions employed by psychologists to help others. Core theoretical constructs and basic counseling techniques are emphasized. This course fulfills a portion of the Mental Health Counselors license requirement.

PSY 511 three credits
Theories of Psychotherapy
The major counseling theories explored in an academic and experiential format. Role playing and videotaping are used. Theories discussed include reality therapy, behavior therapy, rational emotive therapy, gestalt therapy, transactional analysis, client-centered therapy, and the psychoanalytic model.

PSY 512 three credits
Evaluation Techniques
Traditional components of psychological testing, including test construction, test development, test administration and test interpretation, and specific training in frequently administered clinical tests (e.g., MMPI, WAIS and WISC). Beyond traditional test theory, students will be exposed to contemporary evaluation devices including behavioral assessment, interview data, and naturalistic observation.

PSY 513 three credits
Seminar: Topics
Pre- or corequisite: PSY 506
In-depth seminar on selected topics in a field of psychology. A few specific topics will be examined in depth—the historical roots, theories, and current research approaches. Two areas are offered in alternate years: personality and psychopathology; cognition. One of the primary goals of this course is to prepare students for PSY 514, in which knowledge gained in this course will be used to conduct research projects.

PSY 514 three credits
Research Techniques: Topics
Prerequisites: PSY 506, PSY 513
Research techniques in the context of specific topics studied in the associated seminar. Two areas are offered in alternate years: personality and psychopathology; cognition. The course will include both formal and hands-on work.

PSY 515 three credits
Human Growth and Development
Prerequisite: Psychology graduate status
The nature of normative transitions across the life span. The course fosters an understanding of change from conception through death. Special emphasis is given to both cognitive and behavioral theories as well as supporting research. This course fulfills a portion of the Mental Health Counselors license requirement.

PSY 516 three credits
Social and Cultural Foundations
Prerequisite: Psychology graduate status
Nature and dynamics of interpersonal group relations as they occur within a multicultural context. Students will study relations among diverse ethnic, racial, and cultural groups in the United States and globally. The course looks at cross-cultural relations from an interdisciplinary perspective, considering psychological, sociological, and historical factors; considers several relevant issues in counseling from a multicultural perspective, and studies specific cultural groups in the context of therapy issues. This course fulfills a portion of the Mental Health Counselors license requirement.

PSY 517 three credits
Psychology of Close Relationships
Seminar in the study of close relationships. Students will study existing research and learn to think critically about the underlying theory and research. Major emphasis is placed on romantic relationships.

PSY 521 three credits
Behavior Modification and Behavior Therapy
Basic principles of learning as theoretical underpinnings of contemporary applied behavioral psychology. Behavior change techniques derived from learning theory widely used in clinical, education, recreational, and family settings will be examined, and individual group applications compared and contrasted.

PSY 522 three credits
Behavioral Family and Group Counseling
Detailed analysis of the function and structure of the family unit. The academic component includes topics such as family systems, behavioral contracting, networking, family sculpting, power, control, setting behavioral goals, the double bind, the identified patient, groups as a system, and the structuralist approach. The experiential component involves the inter-generational family tree, role playing diagnosis, and evaluation of actual families.

PSY 523 three credits
Behavioral Medicine
An interdisciplinary approach to health and illness. Particular emphasis is placed on the interface of psychology and other allied disciplines with traditional medical approaches. Students are introduced to medical psychology as a profession and exposed to practical applications including stress management and biofeedback training.

PSY 524 three credits
Advanced Behavior Modification and Behavior Therapy
Theoretical and functional considerations for the design and implementation of effective behavior programming. Through readings and analysis of case studies, students gain familiarity with the theoretical and applied principles of behavior modification and therapy.

PSY 570 three credits
Advanced Group Processes
Prerequisite: Psychology graduate status
Theoretical, research, and experiential aspects of the study of group processes or group dynamics. The course examines applications of theory and research in settings such as organizations, organizational development, and group therapy and uses lecture, student seminar presentations, and class experiential

Note: Some graduate courses may be open to undergraduates. Please consult your department chairperson. See the *Graduate Catalogue* for graduate general and program requirements.

self-analytic group activities. This course fulfills a portion of the Mental Health Counselors license requirement.

PSY 575 three credits
Lifestyle, School, and Career Development
Explores the impact of diverse lifestyles on mental health issues and academic and vocational adjustment. The course examines the effect of culture, gender, ethnicity, race, socioeconomic stature, and sexual orientation on psychotherapy, assessment, and academic and vocational adjustment. Special emphasis is given to cultural differences, alternative lifestyles, gay and lesbian issues, family patterns, fairness in testing, the "Bell Curve" debate, career counseling, and the relationship between cultural norms and psycopathology. This course fulfills a portion of the Mental Health Counselors license requirement.

PSY 580 three credits
Graduate Seminar in Psychology
Graduate seminar offered for one semester on a specific topic. Topics vary according to student needs and faculty expertise in particular areas of study.

PSY 589 four credits
Graduate Practicum
Prerequisite: Departmental permission
A distinctly defined, pre-internship, supervised curricular experience. Course requirements include Massachusetts licensing requirements for Master's level mental health counselors. Students provide direct service with a clientele appropriate to the program emphasis. Classroom work includes role plays or other laboratory experiences. Students are provided with both individual and group supervision experiences.

PSY 590 variable credits
Field Experience
Prerequisite: Departmental permission; Corequisites: PSY 511, PSY 512, or PSY 522
Placement at area mental health facilities, involving students in the practical application of the theories being studied in the classroom. The placements vary according to the specific course being taken conjointly.

PSY 591, PSY 592 four credits each
Internship I, II
Prerequisite: Departmental permission
Application of skills acquired through classroom work through internship placements. Students will be placed in mental health agencies and will receive extensive supervision.

PSY 593 variable credits
Seminar in Clinical Methods
Review of research in a major clinical area, for third year graduate students. Students create an in-depth review of the literature, culminating in a final project that is presented to two graduate faculty for review.

PSY 594 variable credits
Seminar in Professional and Ethical Issues
Advanced seminar on legal, ethical, professional, and moral issues facing mental health practitioners. Aspects of testing, assessment, psychotherapy, and psychopathology theory will be central issues. The course culminates in a written or oral exam testing application of clinical knowledge, ethical, and legal issues through a clinical case study model.

PSY 595 three credits
Independent Study
Prerequisites: Permission of instructor, graduate director, and college dean
Independent pursuit of an individual research project under the supervision of a faculty sponsor.

PSY 596 variable credits; typically six
Graduate Thesis
Prerequisite: Departmental permission
Student develops and executes an independent research thesis under the direction of a faculty advisor. Graded A-F.

Sociology and Anthropology

Sociology Major
BA degree

Faculty and Fields of Interest

The department's primary focus is the study of human beings and the analysis of collective action and the socio-cultural settings in which it occurs. The department offers courses in sociology, anthropology, social work, and a number of courses that are primarily interdisciplinary in nature. Sociology is the study of social behavior in its different forms. It is the study of whole societies and their basic institutions (e.g. religion). It also studies human groups on a smaller scale such as the family, peer group, and neighborhood.

Anthropology and sociology overlap somewhat, although an anthropologist is more likely to study non-western societies and to emphasize more the biological base of human behavior, human evolution, and a society's ethos. Social work is the application of concepts from disciplines such as sociology, psychology, and anthropology to an area of concern in modern society. Social work and social action growing out of the basic disciplines (above) increasingly attempt not only to study and treat but create new social realities.

A major in this department may be chosen for the inherent satisfaction that the knowledge of it provides. It also may be the foundation for social action or for graduate work.

Jane Hilowitz American society, European society

Toby E. Huff sociology of law, science and religion; quantitative studies of American society; theory; the Muslim World, globalization, and the Internet

Andrea C. Klimt sociocultural anthropology, construction of identity, Europe, contemporary US, Portuguese diaspore, medical anthropology, migration and transnationalism

Susan Krumholz (coordinator, criminal justice) criminal justice, theories of crime, domestic violence, policing

Yale R. Magrass social theory, historical and political sociology, methodology, social impact of science and technology

Larry M. Miller (co-chairperson) historical sociology, Meso-America, social theory, sociology of art and literature, social education

Thomas K. Ranuga third world studies, social movements, comparative ethnic relations

R. Penn Reeve (co-chairperson) cultural anthropology, social inequality, race and ethnicity, gay and lesbian studies

Jack Stauder anthropology, marriage and family, social change, morality and human nature, environmental issues, ranching and the American West

Students are offered, in addition to the many selections in general sociology, three major options, the option in anthropology, the option in criminal justice, and the option in social services.

The courses listed "SOC or ANT" are courses that bridge the fields of sociology and anthropology. Students may elect to gain credit in either field by registering in the course and selecting one prefix. Anthropology credits can be counted toward a sociology major.

Students must have a 2.0 cumulative grade point average to be accepted into the major and must maintain a 2.5 GPA in major courses in order to graduate with a sociology major.

Sociology Major
General Option

Requirements

Majors are required to take 30 credits in the department, including 12 upper-division credits.

	Credits
SOC 101 Introduction to Sociology **OR**	3
ANT 111 Cultural Anthropology **OR**	
SOC/ANT 113 Intro. to Social and Cultural Behavior	
Methods Requirement	3
SOC 206 Intro. to Research Methods **OR**	
SOC/ANT 401 Research Methods	
Theory Requirement	3
SOC 200 Intro. to Social Thought **OR**	
SOC 358 Criminological Theory **OR**	
SOC 402 Sociological Theory **OR**	
ANT 405 Anthropological Theory	
Electives in Sociology or Anthropology	21
Total	**30**

Sociology Major Common Departmental Distribution Requirement

To expose sociology majors to important subject areas in the field and offer organization and coherence to their choices, we require one course from each of the following four areas. This departmental distribution requirement is to be met within the requirements and electives of the student's sociology major or option. Courses which have not been included (special topics, readings courses, independent study) may be substituted for courses in the various areas, where appropriate and with approval of the student's advisor. New courses may be added to each of the three areas as appropriate, again with approval.

All majors are required to complete one course from each of the three categories.

Cultural and Social Institutions
SOC 102 Social Problems
SOC 164 Environmental Issues
SOC 167 The Human Environment
SOC 203 Social Welfare Policy
SOC 209 Sociology of Life, Death, and Meaning
SOC 220 Social Change
SOC/ANT 268 Environmental Issues
SOC 301 Sociology of Work
SOC 302 Sociology of Art
SOC 312 Deviant Behavior
SOC 323 Morality and Society
SOC 325 Sex, Marriage, and Family
SOC 341 Community Organization
SOC 342 Organization of Criminal Behavior
SOC 350 Culture and the Experience of Nature (Reading Course)
SOC 351 Landscape and Gardens (Reading Course)
Designs of the Living World (Reading Course)
SOC 357 Justice and Society
SOC 381 Social Impact Science/Technology

Difference and Social Inequality
SOC 305 Political Sociology
SOC 230 Black Identity & the Social World
SOC/ANT 300 Lesbian, Gay, and Bisexual Identity and Culture
SOC 310 Social Movements
SOC 330 Blacks and Whites in America
SOC 336 Women and Social Policy
SOC/ANT 337 Comparative Ethic Relations
SOC 351 The Black Family (Reading Course)
SOC 356 Wealth, Status, Power in America

Continued in column to right

Comparative Cultures and Global Issues
ANT 111 Introduction to Cultural Anthropology
SOC/ANT 113 Introduction to Cultural and Social Behavior
SOC/ANT 160 Cultural Evolution
SOC 205 Indust. Society & Human Problems
SOC.ANT 327 Myth and Ritual
SOC/ANT 332 Portuguese in the Americas
SOC 334 Sociology of Food
SOC 340 Law and Society
SOC 350 Women and Islam (Reading Course)
SOC/ANT 351 Health, Disease, and Curing (Reading Course)
SOC/ANT 361 Peoples and Cultures of Europe
SOC/ANT 363 Environment and Development
ANT 372 Peace Studies

Sociology Major
Option in Anthropology

Requirements

This option introduces students to the anthropological perspective: the physical and cultural evolution of the human species; prehistoric cultures, comparison of cultures from different parts of the world. Intended for students interested in a cross-cultural world perspective as a sound basis of a liberal arts education and/or as preparation for graduate school in anthropology or employment in a variety of fields.

Majors are required to take 30 credits in the department, including 12 upper-division credits.

	Credits
ANT 110 Intro. to Physical Anthropology	3
ANT 111 Intro. to Cultural Anthropology	3
ANT 261 Introduction to Archeology I	3
Theory requirement	3
ANT 405 Anthropological Theory **OR**	
SOC 200 Intro. to Social Thought	
Methods requirement	3
SOC/ANT 206 Intro. Research Meth. **OR**	
SOC/ANT 401 Research Methods **OR**	
SOC/ANT 407 Field Inquiry	
Electives in sociology or anthropology	15
Total	**30**

General Education Departmental Requirements

Students majoring in Sociology and Anthropology will meet their departmentally-controlled General Education requirements as follows:

Area E: Students will select a course from approved list
Area I, Tier 2: TBD
Area W, Tier 2: Students will select a course from the approved list
Area O: Students select a course from approved list

Sociology Major
Option in Criminal Justice

The program in criminal justice is an interdisciplinary concentration grounded in the liberal arts tradition. It draws on the full range of the university's resources to give students new opportunities to combine a university education with enhanced avenues for career advancement and public service.

Students wishing to chose this option should consult a faculty advisor in the Department of Sociology and Anthropology.

In addition to providing a university education for students who aspire to serve in the criminal justice system, UMass Dartmouth's program seeks to foster an understanding of the role of criminal justice systems in democratic societies. The intent of the training is to study the whole range of criminal justice activities and agencies which extend from the commission of criminal acts, the police and the courts, to probation, parole, and the social service system. Efforts have also been made to incorporate comparative and historical perspectives which focus on the processes which give rise to legal and extra-legal activities. Courses in counseling, as well as probation and parole, will form an integral part of the program.

All "pre-service" students will be required to take a one-semester internship. The student will be placed in a relevant position in the criminal justice system, such as a parole office, court, or correctional institution, and his or her experience will be supervised by a UMass Dartmouth faculty member.

Students with one or more years of working experience in the criminal justice system will substitute SOC 400 (Special Topics) or SOC 495 (Independent Study) for the Internship upon the recommendation of the Chairperson of the Department.

Requirements

		Credits
Required Core Courses		
Introductory Requirement		3
SOC 101	Introduction to Sociology **OR**	
ANT 111	Introduction to Cultural Anthropology **OR**	
SOC/ANT 113	Introduction to Social/Cultural Behavior	
Theory Requirement		3
SOC 200	Introduction to Social Thought	
Methods Requirement		3
SOC/ANT 206	Research Methods **OR**	
SOC/ANT 401	Research Methods	
Required Core Courses		15
SOC 190	Introduction to Criminal Justice	
SOC 270	Criminal Due Process	
SOC 358	Criminology	
SOC 400	Special Topics	
SOC 450	Internship	
Two courses from Group I - Systems		6
SOC 305	Political Sociology	
SOC 310	Social Movements	
SOC 323	Morality and Society	
SOC 340	Law and Society	
SOC 357	Justice and Society	
Two courses from Group II - Context		6
SOC 203	Social Work I	
SOC 342	Organization of Criminal Behavior	
PHL 326	Philosophy of Law	
PSY 202	Abnormal Psychology	
PSY 406	Counseling	
Two courses from Group III - Multicultural		6
SOC 330	Black and White in America	
SOC 332	Portuguese in the Americas	
SOC 336	Women and Social Policy	
SOC 337	Comparative Ethnic Relations	
SOC 356	Wealth, Status, and Power	
	Total	**42**

Other courses may be substituted at the discretion of the Coordinator for the Criminal Justice Option

Sociology Minor

A student can request entrance to the minor program in sociology after completing at least 54 credits with a cumulative grade point average of 2.0 and with at least a 2.5 grade point average in his/her major. Requests must be approved by the chairperson of the Sociology/Anthropology Department.

Requirements

The minor in sociology requires completion of at least 18 credits, of which 9 must be at the upper division level. Three courses (as in the major) will be taken which include Introductory level courses (SOC 101, ANT 111, or SOC/ANT 113), a theory course (SOC 200, ANT 208, SOC 402, or ANT 405), and a methods course (SOC 206 or SOC 401 or equivalent methods course in Economics, Political Science, or Psychology), plus three upper-division sociology or anthropology courses. All anthropology courses can count for the Sociology minor, as they do for the major.

Anthropology Minor

A student can request entrance to the minor program in anthropology after completing at least 54 credits with a cumulative grade point average of 2.0 and with a 2.5 grade point average in his/her major. Requests must be approved by the chairperson of the Sociology/Anthropology Department.

The department also offers an option in social anthropology for sociology majors.

Requirements

The minor in anthropology requires completion of at least 18 credits, of which 9 must be at the upper division level. Specifically, they will include ANT 111, either ANT 110 or ANT 261; ANT 208 or ANT 405; and three additional upper level courses Sociology/Anthropology or Anthropology electives.

Sociology/Anthropology Courses

SOC 101 three credits **D**
Introduction to Sociology
A survey of the fundamental principles of sociology and the basic factors conditioning social behavior.

SOC 102 three credits
Social Problems
A survey of various social problems in the contemporary world. Special emphasis will be placed upon analysis of social problems in American society.

ANT 110 three credits
Introduction to Physical Anthropology
A survey of the fundamental concepts of the science of human beings. This course concentrates upon the physical evolution of the human species, the comparison of the behavior of currently existing primates, and interdisciplinary searches into topical questions such as the evolution and nature of aggression and/or hierarchy and dominance.

ANT 111 three credits **G**
Introduction to Cultural Anthropology
An introduction to the basic concepts of social and cultural anthropology. Readings emphasize the comparative study of societies at different levels of socio-cultural integration and from different areas of the world. This may include a brief introduction to physical anthropology and archaeology.

SOC 113 or ANT 113 three credits
Introduction to Social and Cultural Behavior
A combined introduction to Anthropology and Sociology, the comparative study of societies, their similarities and differences and how these are understood by social science.

SOC 159-199 three credits
Social Issues
Courses are offered on selected social issues as student and faculty interest indicate. May be offered under the ANT prefix where appropriate.
Recent offerings include:

SOC 160 or ANT 160 three credits
Social and Cultural Evolution

SOC 164 three credits **E**
Environmental Issues

SOC 167 three credits
Social Issue: Human Environment

SOC 174 three credits
Portuguese/American Cultures

SOC 177 three credits **E**
Introduction to Sex, Marriage, and the Family

SOC 190 three credits
Introduction to Criminal Justice
A broad overview of the criminal justice system and its major component parts, including police, the courts, and corrections.

SOC 200 three credits
Introduction to Sociological Thought
Prerequisite: SOC 101
An introduction to the enterprise of sociological theory. As such, it attempts to introduce students to the questions, problems, and intellectual tasks of theorizing about society and our social lives as well as to expose students to some of the most important competing ways in which previous social theorists have gone about this task.

SOC 203 three credits
Social Welfare Policy
Prerequisite: SOC 101 or 102
Theoretical framework and cross-cultural perspective for understanding the role of the social services in our society. An exploration of the history, politics and economics of our social welfare system will be undertaken through discussion, guest speakers and field work. Cross-listed as WMS 203.

SOC 205 three credits
Industrial Society and Human Problems
An overview of modern society, particularly our own, with an emphasis on the problems and possibilities we face today.

SOC 206 or ANT 206 three credits
Introduction to Research Methods
Prerequisite: SOC 101 or ANT 111 or SOC/ANT 113
An introduction to the concepts and methodology of social science research.

ANT 208 three credits
Introduction to Anthropological Theory
Prerequisite: ANT 111
A historical analytical and current review of the anthropological perspective. Several themes basic to anthropological thinking are compared including, holism, systems and processes, folk versus analytical perspective, and case studies. The systematic nature of anthropological inquiry with testing of

findings, theories, laws, generalizations, and modes of research and interpretation will be noted in the reading of original sources.

SOC 209 three credits
Sociology of Life, Death, and Meaning
An exploration of the exclusion of the organic—birth, death, the body, committed relationships, family, community, and nature—from work or technical performance in industrial institutions.

SOC 220 three credits
Social Change
Prerequisite: SOC 101
Analysis of the processes of social change. Why does social change occur? Attention is given to both economic factors and conscious movements for social change.

SOC 226 or ANT 226 three credits
Sociology of Africa
A survey of change and conflict in African society, historically and at present. Particular attention will be paid to the effects of colonialism and African resistance to it. Cross-listed as AAS 226.

SOC 228 three credits
Sex Roles and Sexuality in American Society
Prerequisite: Permission of instructor
The changing definitions of the roles of men and women in American society from our own experience and from social, historical, and biological perspectives. The course covers the development of male and female in the evolutionary system; human sexuality; cross-cultural sexual identities; images of male and female in American literature, movies, and the popular imagination; socialization and the development of sexual identity; problems of courtship and intimacy. Cross-listed as WMS 228.

SOC 230 three credits
Black Identity and the Social World
The course examines the African past through literature, the survival techniques which Blacks developed in order to survive in an alien world, and the collective identity of Black people at the present time. This course is especially designed for Black students and White students who are concerned with Black heritage. Cross-listed as AAS 230

ANT 261 three credits
Introduction to Method and Theory in Archaeology
An introduction to the principles of method and theory of modern American archaeology.

ANT 262 three credits **G**
Introduction to World Prehistory
An introduction to archaeological documentation of prehistoric socio-political organization. Emphasis on the development of state levels of social organization in an evolutionary perspective.

SOC 268 or ANT 268 three credits
Environmental Issues
Introduction to controversial social issues surrounding environmental problems. The course addresses how modern society is creating and responding to current environmental trends and gives social ecological perspective on our human prospect.

SOC 270 three credits
Criminal Due Process
The law of criminal procedure as defined by the constitution and the courts. This course is designed to familiarize students with the law as it pertains to the work of the criminal justice system and exposes students to case law. Written case briefs are used as an instructional method.

SOC 298 or ANT 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

SOC 300 or ANT 300 three credits
Lesbian, Gay, and Bisexual Identity and Culture
Lesbian, gay, bisexual, and transexual identity, history, and culture, sexual roles, homophobia, heterosexism, the gay liberation movement, and cross-cultural experiences will be examined. Family, health, religious, economic, racial, political and legal issues will be explored.

SOC 301 three credits
The Sociology of Work
Prerequisite: SOC 101 or ANT 111 or SOC/ANT 113
The analysis of work in modern society, and how, historically, labor/management relations have shaped our lives. Cross-listed as LST 301.

SOC 302 three credits
The Sociology of Art
Prerequisite: either SOC 101, SOC 111, SOC/ANT 113, or History of Art; or permission of instructor
The relationship between society and art and artists.

SOC 304 or ANT 304 three credits
Third World Development
Prerequisite: SOC 101, 111, or 113
A study of the "Third World" — its political economy and roots in world history and international relations. The focus will be on understanding the sources of underdevelopment and the possibilities for development.

SOC 305 three credits
Political Sociology
Prerequisites: SOC 101, SOC/ANT 113, PSC 101, 102; or permission of instructor
Sociological perspectives on the study of power relationships, political communities, political processes, and institutions. The course addresses questions like, Who controls America's institutions? What are the rights and powers of ordinary citizens? How are decisions made about war and peace? About the distribution of resources? What is the relationship between political, economic, and ideological power?

SOC 306 or ANT 306 three credits
Cultures of Contemporary Portugal
The cultures of contemporary Portugal. We will draw on the work of anthropologists, sociologists, and historians and focus on key issues including changes in traditional roles of men and women, Portuguese emigration and its effect on Portuguese society, patterns of ritual and religion, and national citizenship.

SOC 308 three credits
Sociology of Religion
Prerequisites: SOC 101 or SOC/ANT 113; and upper-division status
Comparative sociological analysis of religious movements in industrial and non-industrial societies. The interplay between religion and social structure is examined. The church-sect typology and the institutionalizing of religious belief systems will be examined. Consideration will also be given to the influence of religious creeds upon patterns of thought and action and on socio-cultural change.

SOC 309 or ANT 309 three credits
Readings in Sociological and

Anthropological Literature
Prerequisite: Junior or senior standing. Reading and writing on specific sociological and anthropological topics normally not included in the curriculum. Students will work on these topics under the close supervision of individual instructors. Students are limited to one such reading course per semester.

SOC 310 three credits
Social Movements
Prerequisite: SOC 101 or permission of instructor
A sociological analysis of the origin and development of social movements with an emphasis on detailed study of particular social movements. Cross-listed as AAS 310.

SOC 312 three credits
Deviant Behavior
Prerequisite: SOC 101; junior or senior standing
Review of theory and research with emphasis on their implications for a general theory of deviant behavior. Sociological knowledge will be applied to the analysis of selected topics such as: organized crime and drug addiction. Social factors and influences in deviant conduct are given heavy stress. Sociological analysis of the agencies of control will be included.

SOC 320 or ANT 320 three credits
Junior Seminar
Prerequisite: For juniors only; permission of instructor
Students will discuss and write papers on aspects of a subject chosen for the semester.

SOC 323 or ANT 323 three credits **E**
Morality and Society
Inquiry into morality and its role in society and social change. This course will consider the origins and evolution of morality, looking at similarities and difference in the moral codes of different cultures, as well as of different periods of Western history. Attention will be given to sources of change and conflict involving moral issues in modern society.

SOC 324 or ANT 324 three credits
Women in Contemporary Society
The roles and status of women in contemporary societies are examined using an historical and comparative approach. The course integrates theory of sexual inequality and its relation to other forms of social inequality and empirical analysis of the actual conditions of women. Women's participation in social movements in the U.S. and Third World countries is addressed as part of the analysis of the changing roles and statuses of women. Cross-listed as WMS 324.

Soc 325 or ANT 325 three credits **E**
Sex, Marriage and Family
A survey of basic human patterns of bonding and reproduction in different cultures, through human evolution to modern times, focusing on an exploration of issues surrounding sex, marriage and family in contemporary society.

SOC 327 or ANT 327 three credits
Myth and Ritual
Prerequisite: ANT 111 or 113
Exploration of the significance of myth and ritual and the history of their study. Myths and rituals of a world wide sample are analyzed from functional, structural, and symbolic points of view.

SOC 328 or ANT 328 three credits
Cultural Ecology
The study of culture and society from an anthropological and ecological approach, focusing on the interaction between human societies and their natural environment.

SOC 330 three credits
Blacks and Whites in America
A multimedia course focusing on the social and cultural similarities and differences between Blacks and Whites in America. National survey data, field studies, biographies, autobiographies along with novels and films are included among the materials analyzed. Students will also be taught the fundamentals of survey data analysis using personal computers.

SOC 331 three credits
Race and Ethnicity
Prerequisite: SOC 101 or 111 or 113
A study of the concepts of "race" and "ethnic group" and the role these concepts play in social interaction and social differentiation.

SOC 332 or ANT 332 three credits **D**
Portuguese in the Americas
The history, culture, identities, and experiences of Portuguese who have emigrated to the Americas. Emphasis is on the formation of the Portuguese-American communities in southeastern Massachusetts. Published research will be examined and class research projects will be assigned in the local community. Students conduct research projects and oral histories in the local Portuguese community which are published on a web site.

SOC 334 three credits
Sociology of Food
A look at ancient and modern food production and its environmental impact. Diet and nutrition; population pressure and hunger; the politics of food; and, modern food processing and its implications are all subjects of study.

SOC 335 three credits
Social Policy
Prerequisite: SOC 101 or 203
An analysis of the relationship between social needs and societal response with an examination of the effectiveness of current policies in meeting human needs. The policies selected for analysis will be programs and provisions directed toward a specific population, e.g. elderly, women, etc. The policies to be studied will focus on a particular substantive area and may change with each semester that the course is offered.

SOC 336 three credits
Women and Social Policy
Family policy issues in the U.S. such as childcare, family leave, job equity, and marriage and family relationships. U.S. public policy is compared with that of other countries. Cross-listed as WMS 336.

SOC 337 or ANT 337 three credits **D**
Comparative Ethnic Relations
A comparative analysis of interracial and interethnic relations in various areas of the world including the U.S., Latin America, Africa, and Europe. An examination of the causes of interethnic conflict, assimilation, ethnic solidarity, and changes in ethnic identity. Cross-listed as AAS 337.

SOC 340 three credits
Law and Society
Investigation of problems in the sociology of law, including lawmaking processes; administration justice and correctional systems. Comparative analysis of legal systems and their administration.

SOC 341 three credits
Community Organizing
An analysis of the theory and practice of community organizing with particular emphasis on the development of social action and community development techniques on the grass-roots level. This course will be conducted as a seminar with student participation expected in class

discussions. In addition, mini-lectures, field simulations, role-playing, guest speakers, and field observations will be utilized. (Formerly SOC 240) Cross-listed as LST 341 and WMS 341.

SOC 342 three credits
Organization of Criminal Behavior
Prerequisite: SOC 101 or equivalent
Sociological approaches to the study of crime typologies. Criminal behavior is best explained when broken down into types. After discussing the construction of types of crimes, there will be an exploration of the systems within which criminal behavior develops.

SOC 345 or ANT 345 three credits
Human Evolution
A systematic and multidisciplinary approach to the origin and evolution of the human species from its primate ancestors. Topics include the evolutionary relationships of the various groups of modern primates, the divergence and physical evolution of the human lineage and origin of modern Homo Sapiens. In addition an attempt is made to correlate our knowledge of the behavior of the nonhuman primates, ethnography, fossils, and archeology so as to gain insights into the origins and evolution of human social behavior and our distinctive cultural adaptation.

SOC 350 or ANT 350 three credits
Readings in Sociological and Anthropological Literature I
Prerequisite: Permission of instructor
Directed readings and analysis in selected sociological topics. Cross-listed as WMS 350 with appropriate topic.

SOC 351 or ANT 351 three credits
Readings in Sociological and Anthropological Literature II
Prerequisite: Permission of instructor
Directed readings and analysis in selected sociological topics.

SOC 352 or ANT 352 three credits
Readings in Sociological and Anthropological Literature III
Prerequisite: Permission of instructor
Directed readings and analysis in selected sociological topics.

SOC 353 three credits
Readings in Sociological Literature IV
Prerequisite: Permission of instructor
Directed readings and analysis in selected sociological topics. Cross-listed as AAS 353 with appropriate topic.

SOC 355 three credits
Social Work Practice
Prerequisite: SOC 203
The knowledge, values and skills that underlie social work practice. We will consider the roles that social workers assume, the settings in which they work and the methods of intervention that are used in working with individual, groups, and communities. Issues related to cross-cultural social work will also be explored.

SOC 356 three credits
Wealth, Status, and Power in America
The study of the various ways in which different societies assign their members to higher and lower positions of prestige, power, and possessions. A sociological analysis of the ways in which a person's stratified rank influences personality and life-opportunities in society. Cross-listed as LST 356.

SOC 357 three credits
Justice and Society
Prerequisites: SOC 101 or equivalent and junior status; or permission of instructor
An introduction to the wider cultural and legal contexts of the criminal justice system. The course draws on the sociology of law and the police, as well as the functioning of the courts in order to understand the concept of law, the notion of the "rule of law," due process, and the role of constraint in law enforcement in a democratic society.

SOC 358 three credits
Criminological Theory
Prerequisites: SOC 101 or equivalent and upper-division standing
A review of the principal forms of explanation in the social sciences, including environmental, psycho-social, economic, and sociological. Application of these approaches is extended to various forms of behavior including crime and delinquency through the work of Durkheim, Lombroso, Freud, Merton, Sutherland, Lemert, Chambliss, and others.

SOC 361 or ANT 361 three credits
Peoples and Cultures of Europe
Prerequisite: SOC 101 or ANT 111 or SOC/ANT 113
An examination of selected societies of Europe from an anthropological perspective, with special attention paid to rural-urban relations and to processes of transformation and development. An attempt will also be made to account for the similarities and differences of the peoples and societies studied.

SOC 362 or ANT 362 three credits
Peoples and Cultures of the World
Prerequisite: SOC 101 or ANT 111 or SOC/ANT 113
Classic ethnographies and films of peoples in the pre-Columbian Americas, Africa, Melanesia and the Orient. The course features cross cultural exploration through the works of anthropologists like Malinowski, Benedict, Evans-Pritchard and Levi-Strauss and of indigenous peoples like Black Elk. The anthropological concepts and methods of the authors are contrast and effects of different levels of development on lifestyles are considered.

SOC 363 or ANT 363 three credits **G**
Environment and Development
Prerequisite: SOC 101 or ANT 111 or SOC/ANT 113
A search for social change which will improve conditions for all and be beneficial to the long-run survival and future of the planet and our human species. The course discusses action strategies for constructive group living by self-reliant participation in productive activities on local levels and beyond.

SOC 372 or ANT 372 three credits
Peace Studies
Prerequisite: SOC 101, ANT 111, or SOC/ANT 113
A study of peaceful, non-violent societies and observation of the processes and conditions that shape relations of peace and non-violence. The course presents evidence that our human potential for peaceful relationships is strong and is a long-standing part of our human behavior. Studies of peace suggest we have the ability to find new approaches to the attainment of peace in our own violent and warlike time.

SOC 381 three credits
Social Impact of Science and Technology
A look at the scientific and technological world views: the claim that tools are value-free, that knowledge (software, etc.) should be property; that natural and social reality should be quantified.

SOC 400 three credits
Special Topic
Prerequisite: Open to seniors electing the Criminal Justice option, or by permission of instructor
Selected topics such as juvenile delinquency,

probation and parole, white collar crime, and related topics in criminal justice will be offered. May be repeated with change content.

SOC 401 or ANT 401 three credits
Research Methods
Prerequisites: SOC 101 or ANT 111 or SOC 113 or ANT 113; and one advanced course in a social science.
Language and social inquiry; issues related to ideas of knowing, explaining, understanding, confirming, etc.; valuative and effective elements in inquiry; empirical testability of propositions; quantitative and qualitative procedures of data collection and analysis; study of example cases.

SOC 402 three credits
Sociological Theory
Prerequisite: SOC 101 or SOC 113 or ANT 113; and one advanced sociology course.
The synthesizing and integrative functions of theory in the sociological enterprise. The course seeks to awaken an awareness of the nature and role of concepts in theory construction, and to highlight the gains and losses which accrue in all linguistic statements about the world. The work of Marx, Durkheim, Weber, Veblen, Sorokin, G.H. Mead, and R.K. Merton are given special attention, both as pioneering examples of theoretical innovation and as substantive points of departure for future inquiry. Cross-listed as LST 402.

ANT 405 three credits
Anthropological Theory
Prerequisite: ANT 111 or ANT 113
An analysis of the major theoretical orientations of anthropologists toward the two central anthropological questions: the nature and origin of the human species and the nature and origin of culture and civilization.

SOC 407 or ANT 407 three or six credits
Field Inquiry
Prerequisites: SOC 101 or ANT 111, or SOC 113 or ANT 113; and one advanced course in social science; and permission of instructor.
Research problem formulation, study design, and the gathering and analysis of data in Sociology and Anthropology, with primary emphasis upon field work. In addition to reading and seminar discussions, each student will participate throughout the seminar in supervised field inquiry. Interested students should talk with the instructor about field work possibilities and arrangements. Upon the approval of the instructor, students may register for either three or six semester hours in a single semester or three semester hours in each of two successive semesters.

SOC 408 three credits
Social Service Internship
Prerequisites: SOC 203, 355
This course will provide students with the opportunity to integrate social work theory with practice. Students will intern with an agency/organization in the community or on campus and will meet as a seminar to analyze and reflect upon their experiences and to further develop skills and knowledge about the social services in our society.

SOC 420 or ANT 420 three credits
Senior Seminar
Prerequisites: For seniors only; permission of instructor required
Students will discuss and write papers on aspects of a subject chosen for the semester.

SOC 430 three credits
Seminar on Advanced Problems in Sociological Theory I
Prerequisite: Permission of instructor
Selected theoretical problems, theorists or schools of thought examined in depth.

SOC 431 three credits
Seminar on Advanced Problems in Sociological Theory II
Prerequisite: Permission of instructor
Selected theoretical problems, theorists or schools of thought examined in depth.

SOC 450 three credits
Internship
Prerequisite: Senior sociology major or permission of instructor
Students registering for this course are placed in relevant positions in the criminal justice system, such as a parole office, court, or correctional facility, where their work will be supervised by an on-site sponsor as well as Departmental advisor.

SOC 492 or ANT 492 variable credit
Honors Research
Research project under independent faculty supervision, by permission.

SOC 495 or ANT 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

SOC 196, 296, 396, 496 or ANT 196, 296, 396, 496 variable credit
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Earle P. Charlton College of Business

The Earle P. Charlton College of Business serves three distinct and important stakeholders: undergraduate and graduate majors, students from other academic units in the university, and the broader professional and business community.

The Charlton College offers five undergraduate programs in business, all leading to the Bachelor of Science degree. These programs are designed to prepare the graduate for careers in administration, research, and teaching; or for graduate study.

The College also offers a minor in Business Administration that helps non-College majors acquire an understanding of business essentials. College majors have an option to add a Certificate in International Business.

Students in the Charlton College of Business engage in projects and case studies that involve all areas of business–marketing, management, finance, systems development, and accounting. Each student's studies combine real breadth–through courses in arts, humanities, sciences, and social sciences; foundation knowledge in accounting, behavioral science, economics, and mathematics and statistics; oral and written communication–with the advanced specialization of a major field. Students will also gain an understanding of ethical and global issues; political, social, legal, environmental, and technological issues; and the impact of diversity on organizations.

The Charlton College of Business is accredited by AACSB International (Association to Advance Collegiate Schools of Business).

College Mission Statement

The Earle P. Charlton College of Business provides a strong basic business education that challenges students and meets the needs of the southeastern Massachusetts business community and beyond. Grounded in excellent general education programs, the college provides quality undergraduate programs in Accounting, Business Information Systems, Finance, Management, and Marketing. The MBA program provides continuing leadership education for the region and beyond. The college encourages students to be lifelong learners through faculty commitment to scholarly endeavor and active involvement in the business profession and community.

The purpose of our business programs is to instill in our students a knowledge of the best business practices; ethical questions; and the influence of environmental, legal and regulatory, political, social, global, and technological factors on the success of organizational activities.

Earle P. Charlton

At its February 1997 meeting, the University of Massachusetts Board of Trustees voted to name the College of Business at UMass Dartmouth the Earle P. Charlton College of Business. The name honors Earle P. Charlton, a co-founder of the F. W. Woolworth Company, who began his retail empire in 1890 in Fall River, Massachusetts and acknowledges a substantial gift to the College by the Charlton Charitable Trust.

In the words of his grandson, Earle P. Charlton II, "This is the American Dream. My grandfather started with nothing and built an empire of 53 stores across New England to the Pacific Coast and in Canada. He was an inspiration to me, my hero. He wanted to make a difference in the world."

The gift acknowledges a strong belief in the value of public education in our society and in the importance of private support for it. His grandfather "never had the opportunity to go to college," explains Earle P. Charlton II, yet "I know he would be extremely proud to give to these students . . . the opportunity to get the education he missed."

Graduate Program

An MBA program is offered by the Earle P. Charlton College of Business. See the *Graduate Catalogue* for graduate general and program requirements.

Accreditation

The Charlton College of Business is accredited by AACSB International (Association to Advance Collegiate Schools of Business). The College is also a member of this organization.

General Requirements for Undergraduate Programs

The College's five business major programs focus on interrelations among business enterprise, the economy, and society. Students develop skills in the use of quantitative data and theoretical tools in analyzing problems related to business and the economy. They are also assisted in developing the skills and intellectual capacities which foster mature and competent judgement.

Students enrolled as business majors complete a common program of study during the first two years. This lower-division program emphasizes a general education background with courses in the humanities, mathematics, and both social and natural sciences. The objective of this approach is to provide a foundation of work in those academic areas necessary for the appropriate combination of descriptive and analytical skill development to the study of business.

Transfer of Community and Junior College Credit

Generally, lower-level business course credits (first and second year courses) can be transferred from junior and community colleges, assuming the course work is comparable to that offered at UMass Dartmouth. All transfer credits to apply toward the degree are given at the discretion of the College.

The following courses from Bristol Community College will be accepted as equivalent to the following UMass Dartmouth courses:

Bristol Community College:		UMass Dartmouth:	
MAN 11	Principles of Management	MGT 311	Organizational Behavior
ACC 11, 12	Accounting I & II	ACT 211, 212	Accounting I & II
BUS 51	Business Law	MGT 312	Legal Framework Business
BUS 53	Corporation Finance	FIN 312	Financial Management
MAR 11	Principles of Marketing	MKT 211	Principles of Marketing
CPR 11/CIS 11	Intro. to Data Processing	BIS 101	Business Organization

Comparable courses from other community colleges will also be accepted as equivalent to these UMass Dartmouth courses.

Transfer students from community colleges must comply with the university requirement to complete at least 60 credits at UMass Dartmouth. Furthermore, a student needs to complete at least 30 credits of upper-level business courses at UMass Dartmouth. Business elective courses taken at the 100 or 200 level cannot be transferred for upper-division business elective credit, nor can they be transferred as non-business electives.

General Education and Core Business Requirements

Each business student is required to complete a sequence of courses called the Core Business Requirements. In addition, each student who will graduate with the class of 2002 must complete the UMass Dartmouth general education requirement; others are held to the college's distribution requirements. Students take 60 credits of their graduation requirements from outside the College of Business. The remaining 60 credits are in courses from within the College, making up the Core Business Requirements as well as the student's Major Requirements.

The majors in the College of Business meet the General Education requirements in the following manner (some of the following statements are still in process of receiving committee review and approval):

Tier 1 Information and Computer Literacy; Writing Skills ENL 101, 102
- I Information & Computer Literacy (Tier II) GBA 101; MGT 210, 211; ACT 212; BIS 315/ACT 355
- W Writing Intensive ENL 265 (Tier II)
- O Oral Skills ENL 265
- M Mathematics MTH 107
- E Ethics 12 hours within the Core Business Requirement (integrated within GBA101; ACT 211,212; MKT 211; MGT 311; MGT 312; MGT 345; BIS 315/ACT 355; FIN 312; and MGT 490)
- C Cultural and Artistic Literacy 9 credits from Gen Ed list
- S Natural Science and Technology 6 credits, from Gen Ed list
- G Global Awareness 3 credits, from either ECO 231 or 232
- D Diversity 3 credits from Gen Ed list

In addition, students in the Charlton College of Business will take six credits of social sciences (distribution requirement).

Dual Major Requirements for the College of Business

All students who select a dual major within the College of Business must complete a minimum of 24 credit hours for the second business major. This will bring the graduation requirement to at least 144 credit hours for dual majors.

Courses offered outside the Business Curriculum

		Credits
ENL 101, 102	Critical Writing and Reading I & II	6
MTH 107	Elements of College Math Enhanced	3
ECO 231, 232	Principles of Micro/ Macroeconomics	6
ENL 265	Business Communications	3
MGT 210, 211	Business Statistics I & II	6
	Cultural and Artistic Literacy	9
	Diversity course	3
	Natural Science/ Technology	6
	Social science electives	6
	Non-business electives	12

Core Business Requirement

GBA 101, 102	Business Organization	3
ACT 211, 212	Principles of Accounting I & II	6
MKT 211	Principles of Marketing	3
MGT 311	Organizational Behavior	3
MGT 312	Legal Framework of Business	3
FIN 312	Financial Management	3
BIS 315	Business Information Systems (Accounting majors take ACT 355 Accounting Info. Systems)	3
MGT 333	Quantitative Business Analysis	3
MGT 345	Operations Management	3
MGT 490	Strategic Management and Policy Formulation	3

Change of Major to Business

Students will be admitted to the college if they meet one of the following two criteria

They must have a GPA of 2.5 or higher after a minimum of 24 credit hours or they must be in overall good academic standing in their current major and have a GPA of 2.7 or higher in the following core business courses. ACT 211, ACT 212, MGT 210 or MGT 212, and one of the following: FIN 312, MGT 312, and MKT 211

Non-Business majors are prohibited by AACSB from taking more than 21 credit hours of business courses. In addition, Non-Business majors may not take 300/400 level courses within any of the business majors without permission of the Office of the Dean of the Charlton College of Business.

Business Administration Minor

The Minor in Business Administration is designed for non-College of Business students whose objective is to acquire an understanding of business essentials to supplement their own area of expertise. By selecting a Minor in Business Administration, a non-business major can open both educational and career opportunities in business as a secondary area of study. For the non-business student who is planning on entering a Masters of Business Administration program, the completion of the Minor in Business administration would satisfy part of the foundation requirements of the UMass Dartmouth MBA program, as well as MBA programs offered at other institutions.

Admission to the Minor

Any undergraduate degree candidate, at UMass Dartmouth, with a declared major other than one in the College of Business, who has a GPA of 2.4 or higher in ACT 211, and one of the following: FIN 312, MGT 312, and MKT 211, and is in good academic standing in the major will be admitted into the minor. Applications for admission should be made to Richard F. Golen, Assistant Dean for Undergraduate Programs, Charlton College of Business.

Minor Coordinator

Richard F. Golen
Assistant Dean of Undergraduate Programs
Charlton College of Business

Requirements

Complete the following core courses		Credits
MKT 211	Principles of Marketing	3
ECO 231	Principles of Microeconomics	3
ACT 211	Principles of Accounting I	3
MGT 311	Organizational Behavior	3

Select three courses from the following		9	Prerequisites
ACT 212	Principles of Accounting II		ACT 211
BIS 315	Information Systems		
FIN 312	Business Finance		ACT 212, ECO 231
MGT 365	Managing People: Theory and Practice		
MGT 312	Legal Framework of Business		
MGT 345	Operations Management		MGT 333
	Total:	**21**	

At least five of these courses must be completed at UMass Dartmouth.

Course descriptions will be found in the appropriate sections of the Catalogue.

Certain courses may require prerequisites, and students must meet the prerequisites prior to enrolling in any course within the minor.

Admission to any of the majors in the Charlton College of Business is a competitive process.

General Business Course

GBA 101, 102 one and one half credits each semester **E**
The Business Organization I, II
Prerequisite: Freshman only
A two-semester, cross-discipline course for first-year day students, the first business core course. It introduces first-year business majors to the world of business and enriches their first-year experience. It provides students with an overview of business, its environment and its subsystems (e.g. operations, marketing, accounting, finance, and information systems); enhances their information and computer skills; and develops their teamworking skills and attitude. Informational and advising sessions help students make decisions in areas such as the selection of courses, a major, a career, and the utilization of on-campus student resources. This course meets for one-hour per-week for each semester during the student's first year in the Charlton College of Business. (Formerly offered as BIS 101.)

Transfer students, change of major, and students enrolled in the Division of Continuing Education will substitute, later in their program, a 300 or 400-level business elective for GBA 101/102.

Certificate in International Business

The International Business Certificate Program offers a unique opportunity for students to gain exposure to international business through a combination of coursework and travel in an overseas setting.

The program is open to College of Business degree students who are interested in international business.

The Certificate consists of 21 credit hours, which must include an overseas experience (see below), and will be awarded with the diploma at graduation, providing that the student has at least a 2.5 GPA in the Certificate Courses.

The overseas experience can be fulfilled in one of the following ways:

- UMD/CCB sponsored course that has a minimum overseas stay of 2 weeks;
- A semester abroad at a partner university;
- A summer session at a partner university;
- A year abroad at a partner university

During the course of the overseas experience students may take up to 6 credits of course work (or their equivalent) which would fulfill the requirements of the Certificate.

Certificate Requirements

Courses in Foreign Language (6 credits)
Elementary or Intermediate Level

Required Upper Division Elective courses

Courses in Business (3 credits)
Choose one from the following:
MGT 420 International Management
MKT 420 International Marketing
FIN 494 International Financial Management

Course in Economics or Political Science (3 credits)
Choose one from the following:
ECO 371 International Trade
ECO 372 International Finance
PSC 360 Politics and Governments of Western Europe
PSC 361 Chinese Government and Politics
PSC 363 Politics and Government of the Middle East
PSC 381 Contemporary International Relations
PSC 393 Portugal and the European Union
PSC 394 The Politics of European Integration
PSC 395 Politics and Development of Modern Portugal

Additional Upper Division Elective courses (3 credits)
Any 300 or 400 level advanced course in the chosen foreign language
Any 300 or 400 level course in history or sociology, which focuses on the history or culture of the chosen foreign language

General Elective Courses (6 credits)
Any 200 level (or above) course (or courses) in the chosen foreign language not used to satisfy the Language Requirement above.
Any economics or political science course in international issues not used to satisfy the Economics or Political Science elective above
Any history or sociology course in history or culture of the chosen foreign language not used to satisfy the Additional Upper Division Elective course above

The Assistant Dean for Undergraduate Programs must approve certificate participants' course programs. Other courses may be substituted at the discretion of and with the approval of the Assistant Dean for Undergraduate Programs.

Coordinator

Richard F. Golen
Assistant Dean of Undergraduate Programs
Charlton College of Business

Accounting and Finance

The Department of Accounting and Finance offers two major programs leading to the Bachelor of Science degree. The Accounting program is designed to prepare graduates for a variety of careers in accounting through a curriculum that emphasizes technical accounting knowledge and the development of analytical, problem solving and computer skills. The Finance program is designed to produce graduates who can apply financial concepts and analytical skills for use in investment analysis and financial planning.

Faculty and Fields of Interest

Michael H. Anderson financial institutions, corporate finance, international finance

C. Richard Baker (chairperson) financial accounting and auditing

Michael Griffin finance, investments, accounting

Raymond Jackson (interim dean, Charlton College of Business) finance, financial planning

Frederick Jones information systems, financial accounting

Jeanne H. LaFond accounting theory and taxation

Lawrence B. Logan corporate accounting

Kooros Maskooki corporate finance, international finance

Deborah Prentice accounting

Trib Puri corporate finance, international finance

Accounting Major

BS degree

The accounting profession plays an essential role in a modern economy by providing a flow of financial information necessary for problem solving and decision-making by managers within an organization and by investors, leaders, and government agencies. Accountants are important members of an organization's decision-making team. Managers rely on accountants for financial planning, budgeting, and interpretation of financial results. Students learn how to provide information that is relevant and appropriate for a variety of decisions that managers must make.

Investors, lenders, government agencies, and other external parties also rely on accountants and auditors to provide accurate and reliable financial statements about an organization. Students learn how to apply accounting concepts, standards, and regulations in preparing, auditing, and analyzing financial statements.

Because accounting is an information system, there is substantial emphasis in the program on computer and information technology skills, including the use of accounting, spreadsheet, and database applications as well as the use of technology for accounting and tax research.

The accounting program provides a strong foundation for pursuit of a career in private or public accounting, or for further education in graduate school. In private accounting, students may prepare for certification as a Certified Management Accountant (CMA). Preparation for a career as a Certified Public Accountant (CPA) has been enhanced by state regulations that now require 150 hours of education prior to certification. Students interested in a public accounting career should talk with a faculty member to consider ways of achieving the 150-hour requirement.

Requirements

		Credits
General Requirements — Years One and Two		**54**
ENL 101, 102	Critical Writing and Reading I, II	6
MTH 107	Elements of College Math Enhanced	3
MGT 212	Business Statistics	3
GBA 101, 102	The Business Organization I, II	3
ENL 265	Business Communications	3
ECO 231, 232	Principles of Micro/Macroeconomics	6
ACT 211, 212	Principles of Accounting I, II	6
	Cult./artistic literacy	9
	Diversity course	3
	Natural science/technology	6
	Social science electives	6
Core Business Requirements		**24**
MKT 211	Principles of Marketing	3
MGT 311	Organizational Behavior	3
ACT 355	Accounting Information Systems	3
MGT 333	Quantitative Business Analysis	3
FIN 312	Financial Management	3
MGT 312	Legal Framework of Business	3
MGT 345	Operations Management	3
MGT 490	Strategic Management and Policy Formulation	3
Core Accounting Requirements		**24**
ACT 311, 312	Intermediate Accounting I, II	6
ACT 351	Cost Accounting	3
ACT 401	Auditing	3
ACT 411	Taxation	3
ACT 452	Special Topics in Accounting	3
ACT 412	Advanced Taxation OR	6
ACT 421	Advanced Financial Accounting OR	
ACT 431	Advanced Managerial Accounting OR	
FIN 493	Financial Management of Corporation	
Accounting/Business Elective		**3**
Any 300- or 400- level course in College of Business except BIS 315		
Non-Business Electives		**15**
Courses outside the College of Business		
Total credits:		**120**

Accounting Courses

ACT 211 three credits **E**
Principles of Accounting I
Prerequisite: Sophomore standing
Accounting concepts and procedures, studied through the analysis, classification, recording, and summarizing of business transactions. Financial statements are introduced and shown to be a source of essential information for management and others outside of the business. Ethical issues in financial reporting are considered.

ACT 212 three credits
Principles of Accounting II
Prerequisites: ACT 211, sophomore standing
An introduction to managerial accounting emphasizing how managers use accounting data within their organizations for planning, control, and making decisions. The course is structured to provide a foundation of cost terms, systems design, cost behavior, procedural techniques for planning and control, performance measurements, and the use of data for making operational decisions. Ethical issues in managerial reporting are considered.

ACT 311 three credits
Intermediate Accounting I
Prerequisites: A grade of C or better in both ACT 211 and 212 and at least junior standing; for business majors only, or by permission of the appropriate department chair
The first of two courses that provide a comprehensive treatment of financial reporting topics. The course focuses on the conceptual, procedural, and regulatory issues involved in preparing and understanding corporate financial statements.

ACT 312 three credits
Intermediate Accounting II
Prerequisites: A grade of C or better in ACT 311 and at least junior standing; for business majors only, or by permission of the appropriate department chair
A continuation of the study of financial reporting and financial statement analysis that begins in ACT 311.

ACT 351 three credits
Cost Accounting
Prerequisites: ACT 212 and at least junior standing; for business majors only, or by permission of the appropriate dept. chair
A study of the basic concepts, analyses, uses and procedures of cost accounting; cost accounting as a managerial tool for business strategy and implementation of operational decisions; how different costs are used for different purposes; ethical issues in operational decisions.

ACT 355 three credits **E**
Accounting Information Systems
Prerequisites: ACT 211, BIS 101 or ENL 102, or permission of Assistant Dean for Undergraduate Programs; at least junior standing; for business majors only, or by permission of the appropriate dept. chair
A study of the design and implementation of successful accounting systems. Significant attention is devoted to the relationship among components of an accounting system, the use of information for decision-making, and internal control. Ethical issues in providing and using information are considered. For accounting majors and non-business students only. Cannot be used as a business elective by non-accounting majors.

ACT 399 three credits
Internship in Accounting
Prerequisites: At least junior standing; permission of the instructor, department chairperson, and college dean; approved contract filed by end of the add/drop period of the semester; for business majors only, or by permission of the appropriate dept. chair
Work experience at a specialized level supervised for graded academic credit by a faculty member in the student's major field. Terms and hours to be arranged. Students must register in advance to receive credit for an internship in the Business College. Deadline for registration and approval for internship contracts is the end of the add/drop period; no late contracts or registrations will be accepted. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

ACT 401 three credits
Auditing
Prerequisites: A grade of C or better in ACT 311; at least junior standing; for business majors only, or by permission of the appropriate dept. chair
A study of the audit function as performed by the outside public accounting firm. All stages are covered: planning the audit, gathering evidence, review of internal control provisions, development of working papers, analysis of accounts, preparation of statements, and final audit report. The ethics of the accounting profession are stressed throughout the course.

ACT 402 three credits
Advanced Auditing
Prerequisites: ACT 401 and senior standing; for business majors only, or by permission of the appropriate dept. chair
Contemporary issues and problems in auditing and assurance services. Topics may include application of auditing concepts and theory, auditing in a computerized environment, application of judgment relative to assurance services, and management of risk in the contemporary environment.

ACT 410 three credits
Federal Tax Accounting
Prerequisites: ACT 212 and at least junior standing; not for accounting majors; for business majors only, or by permission of the appropriate dept. chair
Overview of the federal, state and local tax laws as they apply to individuals and businesses. This course focuses on specific tax laws which apply to individuals, partnerships and corporations, with emphasis on tax planning rather than preparation of the specific tax forms.

ACT 411 three credits
Taxation
Prerequisites: ACT 212 and at least junior standing; for business majors only, or by permission of the appropriate dept. chair
A study of federal income taxes. Topics will include history and background of the federal income tax system, taxable items, and methods of computation. Research skills will be taught and competency will be developed using both paper and electronic sources.

ACT 412 three credits
Advanced Taxation
Prerequisites: ACT 411 and at least junior standing; for business majors only, or by permission of the appropriate dept. chair
Comprehensive tax research techniques applied to different business entities. The course will enhance both research and communication skill in taxation.

ACT 421 three credits
Advanced Financial Accounting
Prerequisites: A grade of C or better in ACT 311 and ACT 312; senior standing; for business majors only, or by permission of the appropriate dept. chair
Advanced topics in financial accounting. Students will become familiar with accounting for investments, business combinations, consolidated financial statements, and foreign currency translations.

ACT 431 three credits
Advanced Managerial Accounting
Prerequisites: ACT 351 and senior standing; for business majors only, or by permission of the appropriate dept. chair
Advanced concepts and methods of the flow of accounting information through the organization. The course emphasizes uses of accounting so that managers can effectively make plans to control resources, including planning and controlling of business activities and managerial decision making.

ACT 441 three credits
Government and Non-Profit Accounting
Prerequisites: ACT 312 and senior standing; for business majors only, or by permission of the appropriate dept. chair
A study of non-corporate organizations with primary focus on governments, hospitals, colleges and universities, and voluntary health and welfare organizations. Coverage will include principles of fund accounting, financial reporting, budgeting, and auditing governmental and not-for-profit organizations. In addition, topics related to operating a business as a partnership will be included.

ACT 452 three credits
Special Topics in Accounting
Prerequisites: A grade of C or better in ACT 311 and 312; senior standing; for business majors only, or by permission of the appropriate dept. chair
Current topics of interest to the accounting profession

ACT 493 (FIN 493) three credits
Financial Management of Corporations
Prerequisites: FIN 312, at least junior standing; for business majors only, or by permission of the appropriate dept. chair
Advanced work in the management of corporate funds. Selected topics from the various fields of financial activity with emphasis on trends, current problems and research are studied. The topics emphasized include: capital expenditure policies, long-term and short-term financing problems, dividend policies, mergers and consolidating, and trends in financial markets.

ACT 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

ACT 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Finance Major
BS degree

Requirements

The curriculum in finance seeks to develop an understanding of the role played by finance in various organizations. Finance deals with the acquisition and management of resources to accomplish organizational objectives within an acceptable risk/return profile. The financial manager decides how to raise funds in the capital markets and how best to invest these funds in order to accomplish organizational objectives. To accomplish these tasks the discipline of finance has developed a sophisticated set of analytical tools that bring together concepts from a variety of sources such as economics, accounting and mathematics. The concepts and techniques developed in finance are equally applicable to not-for-profit organizations that must also raise and invest funds in an efficient manner. Those skilled in financial analysis play a central role in deciding such current issues as mergers, buyouts and international investments.

		Credits
General Requirements — Years One and Two		**54**
ENL 101, 102	Critical Writing and Reading I, II	6
MTH 107	Elements of College Math Enhanced	3
MGT 212	Business Statistics	3
GBA 101, 102	The Business Organization I, II	3
ENL 265	Business Communications	3
ECO 231, 232	Principles of Micro/Macroeconomics	6
ACT 211, 212	Principles of Accounting I, II	6
	Cult./artistic literacy	9
	Diversity course	3
	Natural science/technology	6
	Social science electives	6
Core Business Requirements		**24**
MKT 211	Principles of Marketing	3
MGT 311	Organizational Behavior	3
ACT 315	Information Systems	3
MGT 333	Quantitative Business Analysis	3
FIN 312	Financial Management	3
MGT 312	Legal Framework of Business	3
MGT 345	Operations Management	3
MGT 490	Strategic Management and Policy Formulation	3
Finance Requirements		**24**
FIN 383	Investment Analysis	3
FIN 385	Applied Capital Budgeting	3
FIN 398	Financial Institutions	3
FIN 484	Advanced Investment Analysis	3
FIN 485	Seminar	3
FIN 493	Financial Management of Corporations	3
FIN 494	International Financial Management	3
ACT 410	Federal Tax Accounting	3
Business Elective Any 300- or 400- level course in College of Business except ACT 355		**3**
Non-Business Electives Courses outside the College of Business		**15**
Total credits:		**120**

FIN 312 three credits **E**
Business Finance
Prerequisites: ACT 212, ECO 231 and at least junior standing
An introduction to the nature of financial management. The course presents the basic tools used in the decision-making process as they pertain to the acquisition, management, and financing current and long-term assets. Working capital policies, the time value of money, capital budgeting, and debt and equity financing are discussed.

FIN 320 three credits
Personal Finance
Prerequisite: at least junior standing
An introduction to the financial planning process of setting goals, developing action plans, creating budgets and measuring results. The student will become familiar with the techniques of financial analyses necessary to make choices when considering housing, insurance, retirement plans, borrowing and other personal finance issues.

FIN 383 three credits
Investment Analysis
Prerequisites: FIN 312; at least junior standing; for business majors only, or by permission of the appropriate department chair
Method and techniques of determining investment merit of various types of securities. Bonds, preferred stocks and common stocks in various types of investment portfolios are studied. The effect of the business cycle on investment policy will be examined and the importance of timing investment commitments will be stressed. The investment techniques of fundamental analysis, technical analysis and efficient market theory are carefully explored. (Formerly FIN 483.)

FIN 385 three credits
Applied Capital Budgeting
Prerequisites: MGT 210 and at least junior standing; for business majors only, or by permission of the appropriate department chair
A study of theoretically valid and readily-applied methods of capital budgeting for business and government organizations. Complexities such as risk, timing and measurement problems dealt with only briefly in introductory courses are examined more fully. Capital budgeting considerations in government organizations not presented in the current finance curriculum will be discussed thoroughly.

FIN 397 three credits
Financing Forecasting Methods
Prerequisites: FIN 312 and at least junior standing; for business majors only, or by permission of the appropriate department chair
A study is made of the dynamic forces on economic activity. National income accounting and analysis, economic indicators and measures, forecasting for the economy of the firm, and problems of stability and growth are considered.

FIN 398 three credits
Financial Institutions
Prerequisites: FIN 312 and at least junior standing; for business majors only, or by permission of the appropriate department chair
A detailed study of the operations of financial institutions and the interrelationships between their operations and economic activity. Emphasis is placed on the effect of economic forces, regulation and technological change on the operations of these institutions.

FIN 399 three credits
Internship in Finance
Prerequisites: At least junior standing; permission of the instructor, department chairperson, and college dean; approved contract filed by end of the add/drop period of the semester; for business majors only, or by permission of the appropriate department chair
Work experience at a specialized level supervised for graded academic credit by a faculty member in the student's major field. Terms and hours to be arranged. Students must register in advance to receive credit for an internship in the Business College. Deadline for registration and approval for internship contracts is the end of the add/drop period; no late contracts or registrations will be accepted. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

FIN 484 three credits
Advanced Investment Analysis
Prerequisites: FIN 383; at least junior standing; for business majors only, or by permission of the appropriate department chair
An examination in greater depth of subjects covered in the foundation investment analysis course and an introduction to recent innovations in the field. Emphasis is give to the place of derivatives in the portfolio, the active management of risk, and the management of retirement assets and pension funds. Assignments include case studies involving the use of computer software and reports requiring an analysis of current research literature.

FIN 485 three credits
Seminar
Prerequisites: FIN 385, 398; senior standing; for business majors only, or by permission of the appropriate department chair
Emphasis on the analysis of case studies. Based on assigned readings in the finance literature, students select a topic for independent research. Progress on the research paper is closely monitored by conferences and class presentations.

FIN 493 (ACT 493) three credits
Financial Management of Corporations
Prerequisites: FIN 312 and at least junior standing; for business majors only, or by permission of the appropriate department chair
Advanced work in the management of corporate funds. Selected topics from the various fields of financial activity with emphasis on trends, current problems and research are studied. The topics emphasized include: capital expenditure policies, long-term and short-term financing problems, dividend policies, mergers and consolidations, and trends in financial markets.

FIN 494 three credits
International Financial Management
Prerequisites: FIN 312 and at least junior standing; for business majors only, or by permission of the appropriate department chair
Understanding the forces that affect the relative value of currencies in international markets, covering the major problems encountered by the firm in financing international operations.

FIN 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

FIN 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Management

The Department of Management offers a major program leading to a bachelor of science degree in Management. The purpose of the Management program is to enable undergraduate management students to gain the requisite understanding of management concepts and to acquire the appropriate application skills which will allow them to function creatively, flexibly, and successfully in private or public, domestic, and global organizations of any size.

Faculty and Fields of Interest

William R. Allen (chairperson) strategic management, organizational behavior, human resources development

Paul Bacdayan organizational behavior, total quality management, management communications

Walter O. Einstein strategic management, organizational behavior/development, leadership, motivation

Laura Forker supply chain management, quality management, process management, service operations management

Richard F. Golen (assistant dean for undergraduate programs) business law, computer law, human resources law

A. Gunasekaran operations management, materials management, total quality management, quantitative analysis

Peter Hughes statistics

Bulent Kobu operations management, quantitative analysis, quality and productivity management

Kellyann Kowalski human resources development, organizational behavior, managing diversity, labor relations

Sharon Ordoobodi quantitative analysis, operations management

Chris Papenhausen managerial and decision organization, equity analysis

Matthew H. Roy organizational behavior

Susanne Scott organizational behavior, team development, leadership and innovation

Dennis Shaul legal framework of business, industrial relations, regulatory law

Kathleen Suchon strategic management, human resources development

Ercan Tirtiroglu quantitative analysis, statistics, information, theory, quality and marketing science

Management Major

BS degree

The Management major seeks to enable undergraduate management students to gain the requisite understanding of management concepts and to acquire the appropriate application skills to function creatively, flexibly and successfully in private or public, domestic, and global organizations of any size.

Requirements

		Credits
General Requirements — Years One and Two		**54**
ENL 101, 102	Critical Writing and Reading I, II	6
MTH 107	Elements of College Math Enhanced	3
MGT 212	Business Statistics	3
GBA 101, 102	The Business Organization I, II	3
ENL 265	Business Communications	3
ECO 231, 232	Principles of Micro/Macroeconomics	6
ACT 211, 212	Principles of Accounting I, II	6
	Cult./artistic literacy	9
	Diversity course	3
	Natural science/technology	6
	Social science electives	6
Core Business Requirements		**24**
MKT 211	Principles of Marketing	3
MGT 311	Organizational Behavior	3
BIS 315	Information Systems	3
MGT 333	Quantitative Business Analysis	3
FIN 312	Financial Management	3
MGT 312	Legal Framework of Business	3
MGT 345	Operations Management	3
MGT 490	Strategic Management and Policy Formulation	3
Management Core Requirements		**12**
MGT 336	Management History and Theory	3
MGT 365	Managing People: Theory and Practice	3
MGT 431	Developing and Managing Work Teams	3
MGT 445	Total Quality Improvement	3
Management Career Direction		**12**
Students must work with their advisor to decide on a particular career direction before undertaking these courses; requires departmental chairperson approval.		
Human Resource Development Requirements		
MGT 443	Human Resources Development	3
MGT 461	Organizational Development	3
MGT 452	Human Resources Law	3
MGT 462	Managing Diversity	3
Operations Management Requirements		
MGT 415	Applied Decision Models	3
MGT 446	Process Design and Management	3
MGT 425	Materials Management	3
MGT 465	Logistics and Supply Management	3
Business Elective		**3**
Any 300- or 400- level course in College of Business except ACT 355		
Non-Business electives		**15**
Courses outside the College of Business		
Total credits:		**120**

Management Courses

MGT 120 three credits
Business, Government, and Social Responsibility
The role of private enterprise in the economy and in society. The course explores economic, political, and ethical dimensions of business actions. Case examples are drawn from around the world. Not for use by College of Business students; specifically, cannot be used as a College of Business elective within the business degree. Students changing to a College of Business major who have taken this course may use it as a substitute for GBA 101/102.

MGT 212 three credits
Business Statistics
Prerequisites: MTH 107; sophomore standing
Examines both descriptive and inferential statistics as applied to business. Topics include graphical and tabular methods of data presentation, probability theory and distributions, hypothesis testing, analysis of variance, regression and forecasting. Emphasis is placed on concepts, applications, and the proper use of statistics to collect, analyze, and interpret data. Throughout this course students will use computer software to perform statistical analyses. Students will learn how to make decisions using facts and the techniques of data analysis. Students will also use the internet to supplement classroom learning.

MGT 311 three credits **E, O**
Organizational Behavior
Prerequisites: ENL 265; junior standing
An interactive skills-building course to improve managerial and team performance. Students will develop an understanding of themselves in relation to others in an organizational context. Class time will be allocated among short lectures, exercises, discussion, process observation, role playing, and team work research. Cross-listed as LST 311.

MGT 312 three credits **E**
Legal Framework of Business
Prerequisite: At least sophomore standing.
Overview of the legal environment of business. Topics covered include contracts, agency and tort law; labor law; securities law. Students will develop a general background in the major aspects of the law as it affects the daily business environment.

MGT 333 three credits
Quantitative Business Analysis
Prerequisites: MTH 107; MGT 210, 211; junior standing; for business majors only, or by permission of appropriate dept. chair

Provides the student with an appreciation of the power and limitations of common managerial techniques used in the analysis of business problems requiring a quantitative decision-making approach. The emphasis is on a careful presentation of problem formulation, mathematical analysis, and solution procedures using examples involving business situations. Computer use is emphasized.

MGT 336 three credits
Management History and Theory
Prerequisites: MGT 311 and at least junior standing; For business majors only, or by permission of the appropriate department chair
A critical review of organizational theory and practice, from the "Classical Schools" to contemporary notions. Students will learn the historical roots of current managerial practices; primary focus will be put upon students being able to examine critically and apply such theories to current business organizations.

MGT 345 three credits
Operations Management
Prerequisites: MGT 333 and at least junior standing
The planning, coordination, and execution of activities in transformation processes in manufacturing and serve organizations where the inputs to the process may be the customers themselves. The role of the operations manager is explored, and attention is given to analytical methods that improve production processes and enhance competitiveness.

MGT 365 three credits
Managing People: Theory and Practice
Prerequisites: MGT 311 and at least junior standing
An examination of the interrelated concepts of motivation and leadership. Students will explore, experientially and theoretically, historical and contemporary theories of supervising, managing, leading, and motivating people in organizational contexts. Specific "real world" tools will be examined for their efficacy in supervising and managing people. Cross-listed as LST 365.

MGT 399 three credits
Internship in Management
Prerequisites: At least junior standing; permission of the instructor, department chairperson, and college dean; approved contract filed by end of the add/drop period of the semester; for business majors only, or by permission of the appropriate department chair
Work experience at a specialized level supervised for graded academic credit by a faculty member in the student's major field. Terms and hours to be arranged. Students must register in advance to receive credit for an internship in the Business College. Deadline for registration and approval for internship contracts is the end of the add/drop period; no late contracts or registrations will be accepted. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

MGT 415 three credits
Applied Decision Models
Prerequisite: MGT 333; and at least junior standing; for business majors only, or by permission of the appropriate department chair
Manufacturing and service applications of selected analytical decision-making tools and techniques. The course illustrates, by example, how manufacturing and service operations can apply quantitative tools to decisions using queuing theory; staffing, scheduling or product mix planning using linear programming; and using simulation in inventory control. (Formerly offered as MGT 334.)

MGT 420 three credits
International Management
Prerequisites: Senior standing; Business Majors only, or by permission of the appropriate department chair
A systematic treatment of management and marketing on a global scale. Emphasis is placed on the study of the dimensions of foreign market environments, marketing across national boundaries and management and marketing simultaneously in two or more national environments.

MGT 425 three credits
Materials Management
Prerequisite: MGT 345 and senior standing; for business majors only, or by permission of the appropriate department chair
Focuses on the management of materials flow within and outside the organization. The course describes strategies, methods and technologies of an efficient materials management system along the supply chain. Topics covered include capacity planning and control, inventory models, materials requirements planning (MRPII), distribution requirements planning (DRP), and Just-In-Time) JIT. The learning process includes case studies, industrial projects, group presentations, participation in professional meetings, and training on an MRP system.

MGT 431 three credits
Developing and Managing Work Teams
Prerequisites: MGT 311, 336, 365 and senior standing; for business majors only, or by permission of the appropriate department chair
An exploration of the concept of team development in U.S. organizations today. Students will examine the approaches, successes, and failures of team development, and will be required to engage in team management and development efforts as a significant part of the course.

MGT 443 three credits
Human Resources Development
Prerequisites: MGT 311, 336, 365 and senior standing; for business majors only, or by permission of the appropriate department chair
The study of sets of systematic, planned activities which organizations develop for the purpose of providing people with skills/knowledge appropriate for the current health and future positive growth of the people and organization. Students will learn basic Human Resources Management skills, the roles of HRD professionals, organizational and individual needs assessment tools/skills; training and development program development tools; and HRD program evaluation skills/techniques. Cross-listed as LST 443.

MGT 445 three credits
Total Quality Improvement
Prerequisite: MGT 345 and senior standing; for business majors only, or by permission of the appropriate department chair
Principles and practices underlying the continuous improvement of quality in the business and non-business enterprise. Particular attention is given to philosophies and methods of managing for quality, and to tools for quality improvement. The instructional approach is highly experiential and interactive, and features contact with quality systems professionals.

MGT 446 three credits
Process Management
Prerequisites: MGT 345 and senior standing; for business majors only, or by permission of the appropriate department chair
Methodologies for the design and management of processes used for delivering and maintaining products and services to customers. This course examines customer requirements for products and services and the contexts in which this information will be used by looking at a total design methodology that integrates customer-focused, technology-independent methods

with traditional engineering design processes. A systems approach is employed that recognizes the impact on the design process of technology, the competitor, the customer, costs of production, and quality, innovation, and delivery.

MGT 452 three credits **D**
Human Resources Law
Prerequisites: MGT 312, 365; and at least junior standing, for business majors only, or by permission of the appropriate department chair
The laws, executive orders, and political and social factors external to firms which affect their human resources management practices. Topics include ethics and social responsibility, regulatory issues, EEOC, affirmative action, performance appraisal, and discrimination in the workplace. Cross-listed as LST 452.

MGT 461 three credits
Organizational Development
Prerequisites: MGT 311, 336; and at least junior standing; for business majors only, or by permission of the appropriate department chair
An exploration of contemporary theories for effectively structuring and maintaining organizations. Students will examine the theories and assumptions which underlie the decisions to configure business organizations. Topics include: OD and systems theory, bureaucratic structures, organic structures, virtual corporations, team structures, the relationship of structure to people, managing change.

MGT 462 three credits **D**
Managing Diversity
Prerequisites: MGT 311, 336, 365; and at least junior standing; for business majors only, or by permission of the appropriate department chair
A skills-building course aimed at increasing awareness of the issues related to managing multicultural workplaces. Focus will be placed on the challenges and opportunities afforded leaders/managers in dynamic U.S.-based workplaces. Personal exploration of prejudices, myths/facts, and perceptions which shape effective leadership will be central to this course. Cross-listed as LST 462.

MGT 463 three credits
Management of Technology
Prerequisite. MGT 461; and at least junior standing, for business majors only, or by permission of the appropriate dept. chair
Issues and concerns in technology adoption and implementation. Particular attention is given to the implication of new technology for business strategies regarding work force, employment, processes, investment, and marketing. The course emphasizes the immense potential of advancing technology and channeling it for higher productivity and better quality. This course serves as an elective in the College of Business.

MGT 465 three credits
Logistics and Supply Management
Prerequisite: Senior standing; for business majors only, or by permission of the appropriate department chair
Skills, issues, and operating procedures in the integrated supply chain process. Attention is given to skills building in negotiation, price/cost analysis, and coverage of logistical resources, organization, and contemporary issues such as E-commerce. The instructional approach is highly participative with in-class simulations case discussions, and contact with industry professionals.

MGT 470 three credits
Management Seminar
Prerequisite: Senior standing; for business majors only, or by permission of the appropriate department chair
Reading and discussion of important research and literature in student's particular field of interest, culminating in a major written paper.

MGT 490 three credits **E**
Strategic Management and Policy Formulation
Prerequisites: MGT 311; 333; 345; FIN 312; BIS 315 or ACT 355; MKT 211; senior standing; for business majors only, or by permission of the appropriate department chair
The capstone course for majors in business administration. Students bring to bear all their functional expertise, communication skills, and problem-solving abilities onto issues faced by senior management in business organizations in the world today. This course is to be taken during the last year of the student's program.

MGT 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

MGT 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Marketing and Business Information Systems

The Department of Marketing and Business Information Systems offers major programs leading to Bachelor of Science Degree.

The purpose of the Marketing Program is to prepare students for careers in domestic and international marketing with a focus on consumers and acquiring information for decision making.

The purpose of the Business Information Systems program is to prepare students for careers in the application of information technology that solve business problems and explore new business opportunities.

Faculty and Fields of Interest

Godwin Araguzo sales management, promotional strategy, consumer behavior

Nora Ganim Barnes marketing research, consumer behavior

John A. Chopoorian (chairperson) international marketing, marketing management

Fahri Karakaya consumer behavior, marketing research, marketing management

Omar E. M. Khalil (assistant dean for graduate programs) management information systems, database systems, information management

Efrem Mallach expert systems, decision support systems, data warehousing

Timothy Shea systems analysis, database systems, management information systems

Shouhong Wang systems analysis, programming, electronic commerce

D. Steven White services marketing, promotion and advertising, selling and sales management, international marketing

Business Information Systems Major
BS degree

The Business Information Systems program of study is designed to prepare students for one of the most rapidly expanding professions in the business world.

BIS prepares the student both to analyze an organization's information systems structure and to design and implement appropriate systems. This major offers a broad educational experience in business, computer applications, the humanities, and social sciences.

The primary emphasis of the program is the application of the "systems approach" to business problem-solving and decision-making. Analysis of both on-campus and off-campus "real-life" business systems provides students with practical experience and increases their value in the professional career market.

Business Information Systems majors differ from computer science majors in emphasizing applications of computer systems over their development and analysis. The applications are focused on complex business needs in organizations. BIS majors conceptualize, design, and implement high quality business systems and build bridges between technical realities, organizational functions, and decision-making by managers.

Requirements

		Credits
General Requirements — Years One and Two		**54**
ENL 101, 102	Critical Writing and Reading I, II	6
MTH 107	Elements of College Math Enhanced	3
MGT 212	Business Statistics	3
GBA 101, 102	The Business Organization I, II	3
ENL 265	Business Communications	3
ECO 231, 232	Principles of Micro/Macroeconomics	6
ACT 211, 212	Principles of Accounting I, II	6
	Cult./artistic literacy	9
	Diversity course	3
	Natural science/technology	6
	Social science electives	6
Core Business Requirements		**24**
MKT 211	Principles of Marketing	3
MGT 311	Organizational Behavior	3
BIS 315	Information Systems	3
MGT 333	Quantitative Business Analysis	3
FIN 312	Financial Management	3
MGT 312	Legal Framework of Business	3
MGT 345	Operations Management	3
MGT 490	Strategic Management and Policy Formulation	3
Business Information Systems Major Courses		**21**
BIS 211	Information Technology Hardware and Software	3
BIS 212	Programming and Problem Solving	3
BIS 322	Systems Analysis and Design	3
BIS 341	Data Communication and Networks	3
BIS 432	Database Design and Implementation	3
BIS 461	Management of Information Systems	3
BIS 462	Advanced Information Systems Project	3
Business Information Systems Elective		**3**
Business Elective		**3**
Any 300- or 400- level course in College of Business except ACT 355		
Non-Business Electives		**15**
Courses outside the College of Business		
Total credits:		**120**

Business Information Systems Courses

BIS 211 three credits
Information Technology Hardware and Software
Prerequisite: Sophomore standing
Provides the hardware-software technological background to enable students to understand the tradeoffs in computer systems architecture for effective use in the business environment. Topics include hardware components (e.g., CPU architeacture, memory, registers, addressing modes, busses, instruction sets, peripheral devices) and software components (e.g., software environment, system software evolution, and the types and functionalities of operating systems and system-user interfaces. BIS majors only, cannot be used to fulfill a Business Elective for non-BIS majors.

BIS 212 three credits
Problem Solving and Programming
Prerequisite: BIS 101; sophomore standing
Develops skills in business computing problem solving. Issues include business data processing, business software development, Web-page development, graphical user interface design, and decision support systems. The course provides an overview of multiple computer languages (COBOL, C++, HTML, JavaScript, Java, and Visual BASIC) that are commonly used in the business field. Students learn to use structured programming and object-oriented programming techniques for business computing. BIS majors only, cannot be used to fulfill a Business Elective for non-BIS majors.

BIS 312 three credits
Web-Based Application Development and Advanced Programing
Prerequisites: BIS 212 and junior standing; for business majors only, or by permission of the appropriate department chair
The use of computer programming to develop Web-based computing applications. Topics include physical design, programming, testing, and implementation of three-tier Web-based information systems. Emphasis is placed on programming on the server's side. Students learn advanced computer programming languages, including CGFI Perl and Java, to implement Web-based business applications.

BIS 315 three credits **E**
Information Systems
Prerequisite: At least junior standing; BIS 101, or ENL 102, or permission of Assistant Dean for Undergraduate Programs.
Provides an understanding of information technology and systems and how information is used in support of decisions and organizational processes. Emphasis is on how information systems relate to organizational systems and decision making, information systems components, implementation and evaluation of systems performance, and ethical issues related to information systems design and use. Cannot be used as a Business Elective by Accounting Majors.

BIS 322 three credits
Business Systems Analysis and Design
Prerequisites: BIS 315 and at least junior standing; for business majors only, or by permission of the appropriate department chair
Provides students with a basic understanding of the process and the techniques of analyzing and designing computer-based information systems. The entire spectrum of system analysis and design will be covered, beginning with the first request for a system study and continuing through with the feasibility, analysis, design, implementation, and maintenance phases of the system development life cycle.

BIS 341 three credits
Data Communication and Networks
Prerequisites: BIS 315 and at least junior standing; for business majors only, or by permission of the appropriate department chair
How individual computers and groups of computers can be linked together via telecommunication networks to form optimally performing, integrated computer networks. Emphasis is placed on how such networks make the best use of available computer resources while also providing computer system users with information of the highest value at the lowest cost. The course also examines the communications environment, regulatory issues, and network pricing and management.

BIS 371 three credits
End-User Software Applications
Prerequisite: At least junior standing; BIS 101; for business majors only, or by permission of the appropriate department chair
Emphasizes computer competency in the use of personal computers in the modern business environment. Personal productivity applications involving spreadsheet analysis, database construction, and advanced word-processing applications are studied.

BIS 372 three credits
Managing PC Workstations
Prerequisites: BIS 315 and junior standing; or permission of instructor; for business majors only, or by permission of the appropriate department chair
Introduction to basic skills and techniques required to manage and maintain PC workstations. Students are introduced to PC operations and maintenance, and are shown how to complete hardware and software installations, step-by-step, using laboratory computer systems.

BIS 375 three credits
Information Systems Applications for Manufacturing
Prerequisite: BIS 315 and junior standing; or permission of instructor; for business majors only, or by permission of the appropriate department chair
Provides a basic understanding of the potential benefits, dangers, and limitations of using information technology (IT) and systems in support of manufacturing. Topics covered include contemporary manufacturing systems, IT-enabled manufacturing, IS applications in manufacturing (e.g., computer integrated manufacturing, CAD/CAM, artificial intelligence, EDI).

BIS 381 three credits
Legal and Ethical Issues in Information Systems
Prerequisite: BIS 315 and junior standing; for business majors only, or by permission of the appropriate department chair
Legal and ethical issues relating to the use of information technology and systems in modern society. Topics to be covered include contracts for computer services such as sales and leasing; intellectual property areas such as software protection, licensing, copyrighting, etc.; tort and constitutional areas dealing with rights of privacy; criminal areas dealing with computer crime, and tax law issues of computer hardware/software.

BIS 399 three credits
Internship in Business Information Systems
Prerequisites: At least junior standing; permission of the instructor, department chairperson, and college dean; approved contract filed by end of the add/drop period of the semester; for business majors only, or by permission of the appropriate department chair
Work experience at a specialized level supervised for graded academic credit by a faculty member in the student's major field. Terms and hours to be arranged. Students must register in advance to receive credit for an internship in the Business College.

Deadline for registration and approval for internship contracts is the end of the add/drop period; no late contracts or registrations will be accepted. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

BIS 432 three credits
Business Data Systems
Prerequisites: At least junior standing; BIS 322; for business majors only, or by permission of the appropriate department chair
Students demonstrate their mastery of the analysis and design processes acquired in earlier courses by designing and constructing databases to meet the information needs of users. Topics covered include data models and modeling techniques, information engineering, database design and implementation, data quality and security, and the client/server environment.

BIS 433 three credits
Advanced Database/E-Business Applications Development
Prerequisite: BIS 432 and senior standing; for business majors only, or by permission of the appropriate department chair
Focuses on advanced database techniques and issues for e-commerce applications including web-based database application development and data warehousing design. The course provides extensive opportunities for applying and extending database concepts learned in BIS 432 (Business Data Systems) through hands-on use of web-based database applications development tools that are commonly used in the business field. Students complete a major project.

BIS 451 three credits
Management of End-User Computing
Prerequisites: BIS 315 and senior standing; for business majors only, or by permission of the appropriate department chair
Theoretical and conceptual framework of end-user computing. The course emphasizes the development of management information systems skills to guide end users in applications, analysis, hardware configuration selection, software package selection, training, and applications development.

BIS 461 three credits
Management of Information Systems
Prerequisites: BIS 315 and senior standing; for business majors only, or by permission of the appropriate department chair
Technical tools and managerial approaches required in the administration of information systems functions and projects. Topics include budgeting and planning, the structure and management of computer operations, measurement of operating performance, project management techniques for systems development and implementation, human resource management, and the role of the information systems manager.

BIS 462 three credits
Advanced Business Information Systems Projects
Prerequisites: Senior standing; for business majors only, or by permission of the appropriate department chair
Capstone course in the Business Information Systems program. Project management techniques are utilized in the development of a functioning information system for an actual organization. Group work is emphasized in the implementation of technology-based solutions to real business problems.

BIS 471 three credits
Advanced Software Applications
Prerequisite: BIS 315 and senior standing; for business majors only, or by permission of the appropriate department chair
Emphasizes the necessity of computer competency in the use of personal computers in the modern business environment. Personal productivity applications involving spreadsheet analysis, data base construction, advanced word processing, and web page design/construction are studied.

BIS 475 three credits
Information Systems and Business Process Design
Prerequisites: BIS 315 and senior standing; for business majors only, or by permission of the appropriate department chair
Introduction to the role if information technology (IT) and systems in support of an organization seeking to improve the efficiency and effectiveness of its business processes. Topics covered include total quality management (TQM) and business process reengineering (BPR). BPR methodologies, enterprise modeling and modeling techniques, IT-enabled change, change management, IS role in BPR projects, and IS role in process management.

BIS 481 three credits
Electronic Commerce/Electronic Business
Prerequisites: BIS 315 and senior standing; for business majors only, or by permission of the appropriate department chair
Provides an understanding of what Electronic Commerce/Electronic Business (EC/EB) involves, how it is accomplished, and its impact on organizations. Both the Business-to-Business and the Business-to-Consumer sides of EC/EB are examined.

BIS 490 three credits
Special Topics in Information Systems
Prerequisite: Senior standing; for business majors only, or by permission of the appropriate department chair
Reserved for special topics in business information systems. May be repeated with change of content.

BIS 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

BIS 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Marketing Major
BS degree

Requirements

The marketing curriculum is designed to prepare students for successful careers in the many phases of marketing and distributing products and services throughout the economy. Graduates are prepared for career opportunities such as research analysts, sales managers, directors of marketing programs, or professional sales personnel.

Courses are oriented toward problem-solving and management decision-making. The total curriculum emphasizes knowledge and competence in marketing that will enable the program's graduates to progress well in the early stages of their careers; to develop the ability to analyze, plan, organize, coordinate, motivate and control; to think creatively; to communicate effectively; and to gain broad perspectives essential to the attainment of ownership or executive management responsibilities.

There are also opportunities for students to gain actual work experience through the International Business Association, which sponsors student-run trade missions to various overseas locations, conducts a special market research program in which students do marketing research projects for area business and organizations, and oversees a student-run advertising agency, OmniAd.

		Credits
General Requirements — Years One and Two		**54**
ENL 101, 102	Critical Writing and Reading I, II	6
MTH 107	Elements of College Math Enhanced	3
MGT 212	Business Statistics	3
GBA 101, 102	The Business Organization I, II	3
ENL 265	Business Communications	3
ECO 231, 232	Principles of Micro/Macroeconomics	6
ACT 211, 212	Principles of Accounting I, II	6
	Cult./artistic literacy	9
	Diversity course	3
	Natural science/technology	6
	Social science electives	6
Core Business Requirements		**24**
MKT 211	Principles of Marketing	3
MGT 311	Organizational Behavior	3
BIS 315	Information Systems	3
MGT 333	Quantitative Business Analysis	3
FIN 312	Financial Management	3
MGT 312	Legal Framework of Business	3
MGT 345	Operations Management	3
MGT 490	Strategic Management and Policy Formulation	3
Marketing Major Requirements		**21**
MKT 331	Promotional Strategy	3
MKT 330	Marketing Intelligence and Information Technology	3
MKT 341	Consumer Behavior	3
MKT 420	International Marketing	3
MKT 432	Sales Management	3
MKT 441	Marketing Management	3
MKT 442	Marketing Research	3
Marketing Elective		**3**
Business Elective		**3**
Any 300- or 400- level course in College of Business except ACT 355		
Non-Business Electives		**15**
Courses outside the College of Business		
Total credits:		**120**

Marketing Courses

MKT 211 three credits **E**
Principles of Marketing
Prerequisite: sophomore standing
A basic understanding of the role and scope of responsibilities facing contemporary marketing management. Emphasis is placed on the integration of marketing principles into an organized approach for decision making.

MKT 330 three credits
Marketing Intelligence and Information Technology
Prerequisite: Junior standing; MKT 211; for business majors only, or by permission of the appropriate department chair
Provides students a working knowledge of secondary data acquisition and analysis. This course places strong emphasis on written and oral communication skills.

MKT 331 three credits
Promotional Strategy
Prerequisites: MKT 211 and junior standing; for business majors only, or by permission of the appropriate department chair
Basic understanding of the factors affecting promotional decisions as well as the role of promotional effort in market strategy planning. The basic principles of advertising, sales promotion and personal selling are integrated.

MKT 332 three credits
Sales Management
Prerequisites: MKT 211 and junior standing; for business majors only, or by permission of the appropriate department chair
Sales programs are formulated and then implemented. This course deals with understanding the importance of these major responsibilities in an age of accelerating product complexity. (Formerly offered as MKT 432).

MKT 360 three credits
Business-to-Business Marketing
Prerequisites: MKT 211 and junior standing; for business majors only, or by permission of the appropriate department chair
A study of contemporary market strategy techniques in industrial companies. Emphasis is placed on the case approach where students are provided an opportunity to develop strategies in response to given market opportunities and competitive behavior.

MKT 370 three credits
Social and Ethical Issues in Marketing
Prerequisites: MKT 211 and junior standing; for business majors only, or by permission of the appropriate department chair
An examination and appraisal of contemporary thought on the extent to which marketing activities influence the ethical and social values of society.

MKT 372 three credits
Retail Management and Fashion Merchandising
Prerequisites: MKT 211 and junior standing; for business majors only, or by permission of the appropriate department chair
Presents a strategic marketing-oriented framework within which the student can appreciate the interrelationships of the industries and forces that make up the businesses bringing "fashion" fiber to market. The course examines the basic concepts fundamental to understanding the retail environment and the operation of retail firms.

MKT 390 three credits
Sports Marketing
Prerequisites: MKT 211 and junior standing
Provides both a practical and theoretical understanding of the growing sport industry, its vital place in society, and the key component that composes successful sport organizations. The course explores managerial and organizational leadership issues that have broad applications in any business career. Case studies are used to sharpen the students' analytical ability, their decision-making skills, and their oral and written communication effectiveness.

MKT 399 three credits
Internship in Marketing
Prerequisites: At least junior standing; permission of the instructor, department chairperson, and college dean; approved contract filed by end of the add/drop period of the semester; for business majors only, or by permission of the appropriate department chair
Work experience at a specialized level supervised for graded academic credit by a faculty member in the student's major field. Terms and hours to be arranged. Students must register in advance to receive credit for an internship in the Business College. Deadline for registration and approval for internship contracts is the end of the add/drop period; no late contracts or registrations will be accepted. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

MKT 420 three credits
International Marketing
Prerequisites: MKT 211 and senior standing; for business majors only, or by permission of the appropriate department chair
A systematic treatment of marketing and management on a global scale. Emphasis is placed on the study of the dimensions of foreign market environments, marketing across national boundaries and management and marketing simultaneously in two or more national environments.

MKT 421 three credits
Advertising
Prerequisites: MKT 211, 331 and senior standing; for business majors only, or by permission of the appropriate department chair
Principal form and applications of advertising alternatives as a part of overall market strategy planning. Considerable emphasis is placed on applied problems which allow for student planning of advertising campaigns.

MKT 425 three credits
Product Strategy
Prerequisites: MKT 211 and senior standing; for business majors only, or by permission of the appropriate department chair
The decision steps of the product development process: innovation strategy, opportunity identification, designing new products, testing and improving products, product introduction and profit management, and implementing the new product development process.

MKT 431 three credits
Consumer Behavior
Prerequisites: MKT 211 and senior standing; for business majors only, or by permission of the appropriate department chair
A study of consumer decision processes as a series of activities related to the purchase and consumption of goods. Emphasis is given to contemporary thought on the consumer problem-solving process, namely problem recognition, search, evaluation, commitment and post-purchase behavior.

MKT 441 three credits
Marketing Management
Prerequisites: MKT 211 and senior standing; for business majors only, or by permission of the appropriate department chair
A capstone course that integrates marketing and business principles learned in prior courses. Being decision-oriented and analytical it sets forth a definite way of surveying current developments in marketing practice, with the advantage of allowing the student freedom, via the case approach, in his or her choice of executive action. Students are required to complete a marketing plan.

MKT 442 three credits

Marketing Research
Prerequisites: MKT 211; MGT 210, 211; MKT 330; and senior standing; for business majors only, or by permission of the appropriate department chair
An examination of the market research process as used in approaching contemporary marketing problems. Emphasis is placed on the current status of research techniques and their application.

MKT 490 three credits
Special Topics in Marketing
Prerequisite: Junior standing and MKT 211; for business majors only, or by permission of the appropriate department chair
Reserved for special topics in Marketing. May be repeated with change of content.

MKT 495
Independent Study variable credit
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

MKT 396, 496
Directed Study three credits
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Graduate MBA Courses

MBA graduate courses are not open to undergraduates. See the *Graduate Catalogue* for general and program requirements and for the descriptions for these courses.

Foundation Courses

MGT 500 three credits
Statistical Analysis

MKT 500 three credits
Marketing Concepts

FIN 500 three credits
Economic Concepts for Managers

ACT 500 three credits
Financial Accounting

FIN 501 three credits
Financial Concepts

MGT 501 three credits
Operations Management

Required MBA Core Courses

ACT 650 three credits
Accounting for Decision Making

BIS 650 three credits
Information Technology Management

FIN 650 three credits
Finance for Decision Making

MGT 650 three credits
Management of Organizational Behavior

MGT 651 three credits
Operations Analysis

MKT 650 three credits
Marketing Strategy

MGT 659 three credits
Strategic Management

Elective MBA Courses

ACT 670 three credits
Financial Statements Analysis

ACT 671 three credits
Management Control and Business Improvement

ACT 672 three credits
Taxes and Business Decisions

BIS 670 three credits
Managing Information

BIS 671 three credits
Managing Systems

BIS 672 three credits
Digital Economy and Commerce

FIN 670 three credits
Investment Analysis

FIN 671 three credits
Personal Financial Planning

FIN 672 three credits
International Financial Management

MGT 670 three credits
Regulatory and Administrative Law

MGT 671 three credits
Management of Organizational Change

MGT 672 three credits
Designing Team-Based Organizations

MGT 675 three credits
International Supply Chain Management

MGT 676 three credits
Business Process Design

MGT 677 three credits
Leading, Motivating, and Empowering Others

MKT 670 three credits
Interactive Marketing

MKT 671 three credits
Marketing Research

MKT 672 three credits
International Business and Multinational Enterprises

Common, Variable Courses

ACT 690, BIS 690, FIN 690, MGT 690, MKT 690 three credits
Special Topics

ACT 695, BIS 695, FIN 695, MGT 695, MKT 695 variable credits
Independent Study

ACT 696, BIS 696, FIN 696, MGT 696, MKT 696 three credits
Directed Study

College of Engineering

The College of Engineering offers engineering programs leading to the B.S. degree in Electrical, Computer, Mechanical, and Civil Engineering and also the B.S. degree in Physics, Computer Science, Textile Science, and Textile Chemistry.

Our engineering programs form a strong foundation in basic sciences, mathematics, and engineering sciences. Our applied science students acquire a strong foundation in the basic sciences and mathematics along with the applied sciences associated with their major. A progression of innovative design experiences culminates in a senior design project. Students in the College of Engineering use high-tech laboratories and sophisticated computer systems, beginning in their freshman year. The many faculty involved with significant research projects bring excitement into the classroom and tie theory to practical applications.

Our students develop the knowledge, creativity, and expertise to succeed in today's rapidly changing technical world. Our graduates are actively recruited by industry and find rewarding careers, or have gone on for advanced degrees in competitive graduate programs around the country.

Through cooperation with industry and government agencies, the College of Engineering also offers students the opportunity to obtain valuable work experience before graduation. Qualified students can participate in internships or cooperative education so that they gain practical engineering experience, a taste of the "real world," and significant income to help offset college expenses.

All undergraduate engineering programs in Civil, Computer, Electrical, and Mechanical Engineering are accredited by the Engineering Accreditation Commission and the program in Computer Science is accredited by the Computing Accreditation Commission of the Accreditation Board for Engineering and Technology, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012.

Mission, Goals, and Objectives of the College of Engineering

The mission and goals of the College of Engineering are molded by the history of the region and the institution, by the existing needs of the region and its people, and by the emerging opportunities for regional economic growth. Building upon its quality undergraduate and expanding graduate programs, its facilities, and its faculty, the **mission** of the University of Massachusetts Dartmouth College of Engineering is *to provide educational opportunities for the region that emphasize teaching and learning, and to provide increased access to the College that will support economic growth in the region, the Commonwealth, and beyond.*

Given the above mission the educational **goals** of the University of Massachusetts Dartmouth College of Engineering are *to provide its graduates with a solid foundation of knowledge, and a level of skill that will allow them to function successfully in their professions upon graduation, and to have a breadth of education that will allow them to meet the needs of the contemporary workplace and to be life-long learners.*

In particular, it is our intention to demonstrate that a graduate of the UMass Dartmouth College of Engineering will have met the following outcome **objectives**:

- the ability to apply knowledge of mathematics, science, and engineering;
- the ability to design and conduct experiments, as well as to analyze and interpret data;
- the ability to design a system, component, or process to meet desired needs;
- the ability to function on multidisciplinary teams;
- the ability to identify, formulate, and solve engineering and science problems;
- the understanding of professional and ethical responsibility;
- the ability to communicate effectively;
- the broad education necessary to understand the impact of engineering and scientific solutions in a global/societal context;
- a recognition of the need for and an ability to engage in life-long learning;
- a knowledge of contemporary issues; and,
- the ability to use techniques, skills, and modern engineering and science tools necessary for professional practice.

The knowledge and skills represented by the above list, which are consonant with those of the Accreditation Board for Engineering and Technology (ABET), are essential in contemporary engineering and science endeavors, and contribute significantly to the graduate's ability to function successfully in the ever-challenging and exciting engineering and science professions.

Transfer Agreements

The College of Engineering seeks to facilitate the transfer of students from community colleges, and from four-year institutions that lack the engineering baccalaureate, by means of a variety of transfer and matriculation agreements.

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Course and program articulation matrices are maintained to facilitate planning and transfer between UMass Dartmouth engineering curricula and the courses and programs at Bristol, Massasoit, and Cape Cod Community Colleges. Transfer applicants from other institutions are assessed individually.

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Students at the University of Massachusetts Boston, Framingham State College, and Worcester State College who complete an identified 2-year curriculum and meet conditions for a standard of performance receive guaranteed admission to identified engineering programs at UMass Dartmouth.

Distribution Requirements / General Education Requirements for Civil, Computer, Electrical, and Mechanical Engineering

Degree candidates in the College of Engineering must satisfy the university's General Education requirements, as described in the Academic Policies section of this Catalogue.

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General Education requirements in Areas M and S and the Tier 1 Writing/Information requirement are automatically satisfied by the courses shown as required for these majors.

•

The General Education requirements in Areas C, G, and D may be fulfilled by selecting courses from the approved lists in each area, using the General Education electives shown in the course requirement tables for each major.

•

The requirements for General Education areas E, I, W, and O will be specified within courses that are included in each major. Requirement tables for these areas are included for each major.

Cooperative Education and Internships in the College of Engineering

College of Engineering students have the opportunity to gain valuable work experience with industry and government agencies, before graduation. Working as engineers in industry or government agencies can provide engineering students with an exceptional educational experience.

We encourage students majoring in any of the engineering fields to participate in co-op, engineering, or computer science internship opportunities.

Cooperative Education

Through cooperative education, students alternate work and school sessions. Co-op students often earn substantial income while completing their degree. This can reduce the financial burden of a college education. Furthermore, co-op students frequently are offered higher starting salaries after graduation. Meaningful, "real world" work experience often improves learning by providing practical connections for classroom theory. Technical work experiences can also help students make better choices of courses or career paths.

Eligible Students
Civil and Environmental Engineering, Computer Engineering, Computer Science, Electrical Engineering, Mechanical Engineering, and Physics students are eligible to participate in the Cooperative Education Program. Students who meet specific academic standards defined by their respective department are invited to enroll in the program. All students are expected to attend special seminars which prepare them for interviewing and for working in industry.

Those who choose to participate in co-op arrange interviews with co-op companies in March and April. Selection for work assignments is made by the employers and therefore cannot be guaranteed. However, students who are somewhat flexible about the nature and location of the assignment usually will not have difficulty obtaining one. Faculty make every effort to see that each student is placed.

In order to remain in the co-op option, students must maintain acceptable academic and work performance while making satisfactory progress toward their degree. While working for a company, students must abide by the rules and regulations of their employer. In addition, students on work assignment must have appropriate health insurance as specified by the university.

Schedule
Co-op students alternate work and school every other session until the first semester of the senior year. The structure of the program allows for an employer to hire student "pairs," with each student employee following an alternating schedule. While one student is out on a work session [A], the other is taking courses [B]. There is an "early start" option - Tracks 1 A and 1 B, and a "late start" option - Tracks 2 A and 2 B.

Track 1 A

fall	sprg	sumr
F1	F2	W
So1	W	So2
W	J1	W
J2	W	E
Sr1	Sr2	

Track 1 B

fall	sprg	sumr
F1	F2	So1
W	So2	W
Jr1	W	E
W	J2	W
Sr1	Sr2	

Late Start Option
Track 2 A

fall	sprg	sumr
F1	F2	O
S1	W	S2
W	J1	W
J2	W	E
Sr1	Sr2	

Track 2 B

fall	sprg	sumr
F1	F2	O
S1	S2	W
J1	W	E
W	J2	W
Sr1	Sr2	

Key

W	Co-op work session
F1, F2	Fresh. semester 1 & 2
S1, S2	Soph. semester 1 & 2
J1, J2	Junior semester 1 & 2
Sr1, Sr2	Senior semester 1 & 2
O	Open
E	Extra sessions, for electives or to fill in requirements

Because of the enforced schedule, students should plan their programs of study carefully in order to get the courses they want. Any modification to the above schedules requires approval of a co-op faculty coordinator and the co-op director. Most students complete five work sessions. To receive co-op certification upon graduation students must complete a minimum of four work sessions and satisfactorily meet all co-op requirements. Co-op certification will be documented on students' transcripts.

Internships

Many faculty in the College of Engineering at UMass Dartmouth have excellent relationships with engineering employers in the region and nation, generating many opportunities for engineering internships. In addition, students often contact employers directly and arrange internships with the assistance of faculty advisors.

An internship is a supervised, practical learning experience, usually occurring during the last two years of the student's program. For students in the College of Engineering, an intern would be employed to do engineering work with a company or government agency while earning university credit. Supervision would be provided by the company or agency, and the work would be done outside the university *except in unusual circumstances.* A faculty advisor monitors the internship and works with the company or agency to see that the work is appropriate for the course credit being given.

Each department in the college of engineering has an Engineering Internship course which can be used as at least 3 credits of technical electives (CEN 400, ECE 400, or MNE 400). In order for a student to enroll in one of these courses, the work activity must provide a learning experience equivalent to that obtained in a typical technical elective. The student must file a proposal detailing the work and learning experience for approval by their internship advisor before the experience begins. The student should keep a daily journal history of the work done and send copies or a written summary report to the advisor each week. The student must submit a summary report on the work experience before credit can be given. The individual courses may have other requirements which also must be met, as found in the course listings. Co-op students can use one of these engineering internship courses to obtain credit for a qualified work session experience.

A work experience which does not qualify for technical elective credit may be able to qualify as an Experiential Learning Internship and earn free elective credit under the rules of the Experiential Learning Program administered through the Office of Career Services. College of Engineering interns in this program must meet the advising, proposal and report writing requirements of the previous paragraph in addition to the requirements of Experiential Learning.

Internships are usually done part time while the student continues taking classes; however, some internships are full time for a semester or more and may be far from campus. In those cases the intern may not be able to enroll in other courses. However, students enrolled in a university-recognized internship must have appropriate health insurance as specified by the university regardless of internship work location and the number of credits.

Alternative Paths

The engineering programs are rigorous, requiring strong high school preparation and high motivation. Students who have demonstrated an aptitude for engineering based upon SATs, or have demonstrated the ability and motivation for engineering studies as evidenced by their high school record but have some deficiencies in their high school program of study, may still be offered admission to the college of engineering.

These deficiencies are detected by the placement test conducted during freshman orientation. Depending on the results of tests in mathematics -- algebra and calculus readiness -- students may be placed into one of three courses in the fall semester: (a) MTH 111 (or 113) Calculus, (b) MTH 131 Precalculus, or (c) MTH 100 Basic Algebra. In the first case, the students will follow the standard programs shown on the following pages for each major. In cases (b) and (c), for the first year, the student will enroll in the courses shown for Precalculus-ready and Algebra-ready students under each major. Some students in cases (b) and (c) may be able to up-grade their mathematics standing by taking selected courses during the summer. If they are able to improve their Accuplacer scores sufficiently on a re-test, they will be placed in a higher-level math course and curriculum.

Reduced Load

Students may carry a lighter course load than that defined by the standard curriculum. A five year schedule is recommended for those students who need time for a part time job, sports, or other time-consuming extracurricular activities. Many students who start on the standard curriculum later find it necessary to extend their program to 4 1/2 years or 5 years. For many students it is better to plan on a 5 year schedule from the beginning. Personalized programs can be arranged through consultation with the student's faculty advisor or the Academic Advising Center.

Gen Ed note: Engineering courses satisfy the Natural Science and Technology requirement. Those marked **S** are appropriate for non-science/engineering majors.

Engineering Core Courses

The following courses are taken in common by students in some of the majors in the college.

EGR 105 two credits
Introduction to Engineering Through Applied Science I
1.5 hours lecture, 1.5 hours laboratory
Corequisites: PHY 111, MTH 113
An introduction to engineering and applied science that emphasizes development of engineering problem-solving skills through work on team projects in engineering mechanics. The course applies calculus and physics problem-solving skills to projects that are directed by faculty from the Mechanical Engineering department. The course develops team work, written and oral communication skills and uses computer assisted learning.

EGR 108 two credits
Introduction to Engineering Through Applied Science II
Corequisites: PHY 112, MTH 114
An introduction to engineering and applied science that emphasizes development of engineering problem-solving skills through work on team projects in DC and AC circuits, electromagnetics, and computer measurement and control. The course applies calculus and physics problem solving skills to projects in the Computer Engineering, Electrical Engineering and Mechanical Engineering disciplines. The course develops teamwork, written and oral communication skills, and uses computer tools (Electronic Workbench and MATLAB) for analysis and simulation.

EGR 131 1 credit
Introduction to Design
0.5 hours lecture, 1.5 hours laboratory
Covers computer-graphic design material and develops graphic communication skills.

EGR 232 three credits
Principles of Thermodynamics
3 hours lecture
Pre- or corequisites: CHM 152, MTH 211
A single semester comprehensive course in thermodynamics for non-Mechanical Engineering majors. The fundamentals of classical thermodynamics are presented. The first and second laws are formulated and applied to basic engineering systems. Properties of pure substances, their calculation and measurement are explored. Formulae and concepts for evaluating efficiency are derived. The combined first and second laws are used to develop the concepts of useful work, availability and exergy. Engineering applications are discussed and studied as time allows.

EGR 241 three credits
Engineering Mechanics I: Statics
3 hours lecture
Prerequisites: PHY 111 or PHY 113, MTH 112 or MTH 114
The first course in engineering mechanics, with two major objectives: first, to introduce the student to the science of engineering mechanics and second to introduce the student to the art of applying science to the solution of engineering problems. The specific vehicle or curriculum to accomplish these objectives will be a study of the statics of rigid bodies.

EGR 242 three credits
Engineering Mechanics II: Dynamics
3 hours lecture
Prerequisites: EGR 241, MTH 211 or MTH 213
Corequisite: MTH 212 or MNE 212
A continuation of the study of mechanics initiated in EGR 241. Work and energy methods are emphasized. Motion in accelerating coordinate systems and dynamics of system particles lead to the discussion of rigid body dynamics in three dimensions. A number of examples of rigid body motion are discussed. Free and forced vibrations of one degree of freedom, and free vibrations of multi-degree of freedom systems, are studied. The principle of virtual work is introduced and used to briefly discuss stability of equilibrium.

EGR 301 three credits
Applied Engineering Mathematics
3 hours lecture
Prerequisite: MTH 212 or MNE 212
Mathematical methods useful to all engineering students. They include: elements of linear algebra, matrices, eigenvalue problems, systems of ordinary differential equations, Fourier series, partial differential equations, probability theory, mathematical statistics, and a brief introduction to complex numbers.

Engineering Courses for all UMass Dartmouth Students

The following courses are offered by the College of Engineering as interdisciplinary courses or as courses that may satisfy distribution and science requirements.

EGR 101 three credits **S**
The Technical Nature of the Human Environment
3 hours lecture
Three consecutive five-week mini-courses, primarily for non-engineers, designed to develop an understanding of the technical nature of structures such as buildings and bridges, transportation systems, and environmental systems. (Formerly EGR 100.)

EGR 157 three credits **S, O**
Science of Engineering
2 hours lecture, 1 hour laboratory
Prerequisite: honors requirements (3.2 G.P.A. or by invitation)
The scientific principles underlying the practice of various engineering disciplines. This honors-level course is for non-science and non-engineering majors.

EGR 203 three credits **S**
Environmental Geology
3 hours lecture
A brief outline of earth's development to the present and basic materials of geology—rocks, minerals, and geological processes. The course examines how geologic processes and hazards influence human activities, the geologic aspects of pollution and waste disposal problems, etc. Prior exposure to geology or college-level math or science is not necessary.

Civil and Environmental Engineering

Faculty and Fields of Interest

Civil and environmental engineering is the engineering of constructed facilities; of buildings, bridges, tunnels, and dams; of harbors and airports; of waterways, railways, and highways; of water power, irrigation, drainage, and water supply; of wastewater and hazardous waste disposal and environmental health systems. Civil Engineers are the professionals who plan, design, direct the construction, and often maintain these facilities.

The program is accredited by the Engineering Accreditation Commission of the Accreditation Board of Engineering and Technology. The department also participates in the college's co-op program.

William Edberg structural engineering

Neil Fennessey hydrology, water resources engineering

Thomas Paul Jackivicz environmental engineering, surveying

Madhusudan Jhaveri geotechnical engineering, solid mechanics

Heather J. Miller geotechnical engineering

Walaa S. Mogawer (acting chairperson) transportation engineering

Christos Papakonstantinou structural engineering

Sukalyan Sengupta environmental engineering

Mission
The Civil and Environmental Engineering Department at UMass Dartmouth offers a Bachelor of Science in Civil Engineering. The program provides service to meet the needs of students, industry, government, and society. The program offers excellence, access, and value through a strong commitment to teaching, scholarship, outreach, and professionalism. The program contributes to the economic development of the region by providing a resource of practice-oriented education for local industry and business, by conducting research, and by active involvement in community affairs.

Objectives
The Department has the following program objectives:

- To educate students in the principles that underlie technological applications related to general engineering and subspecialty areas within civil and environmental engineering: structural engineering, geotechnical engineering, hydrology and water resources engineering, environmental engineering, and transportation engineering.
- To develop engineers who are articulate in communicating science and engineering concepts.
- To provide a flexible curriculum to meet the diverse needs of an ever-diverse student body, including a cooperative education program and intern opportunities.
- To empower graduates with tools related to contemporary professional practice in civil and environmental engineering at the entry level.
- To inspire graduates to become leaders in their professional endeavors.
- To inspire graduates to further their education in graduate schools, not only in engineering but also in other professions, and to encourage the attitude of lifelong learning.
- To develop an awareness in graduates of the interrelated context in which engineering is performed: political, societal, economic, and ethical.

Civil Engineering Major

BS degree

The academic preparation for a profession which is as varied as civil and environmental engineering requires considerable breadth as well as depth. The department provides this breadth and depth through its stated objectives. Each student's program includes a sequence of technical electives which are a combination of engineering sciences and engineering design that culminates in a meaningful major design experience. To better prepare the student to take his or her place as a citizen as well as a professional, the curriculum is also designed to include a number of courses in the humanities and social sciences.

Civil Engineering Certificate Programs

The UMass Dartmouth Department of Civil and Environmental Engineering participates along with Massachusetts Maritime Academy and Cape Cod Community College in four Certificate programs:

- Environmental Site Assessment Certificate
- Wastewater Management Certificate
- Coastal Zone Management Certificate
- Geographical Information Systems (GIS) Certificate

For further information, contact the UMass Dartmouth Continuing Education Office, extension 8071, or Environmental Technology Program, Cape Cod Community College, West Barnstable, MA 02668; phone 508 362-2131.

General Education Departmental Requirements

Students majoring in Civil Engineering will meet their departmentally-controlled General Education requirements as follows:

Area E: CEN 452
Area I, Tier 2: CEN 161, CEN 306, CEN 311
Area W, Tier 2: ENL 266
Area O: CEN 491

Requirements

		Semester Credits First	Second
First Year			
ENL 101, 102	Critical Writing and Reading I, II	3	3
CHM 151, 152	Principles of Modern Chemistry I, II	3	3
CHM 161, 162	Intro Applied Chemistry Engineers I, II	1	1
MTH 111, 112	Analytical Geometry and Calculus I, II	4	4
PHY 113	Classical Physics I		4
CEN 161	Civil Engineering Design Graphics	3	
		14	**15**
Second Year			
EGR 241, 242	Engineering Mechanics, I, II	3	3
MTH 211, 212	Calculus III, Differential Equations	4	3
CEN 201	Surveying	3	
CEN 211	Surveying Laboratory	1	
CEN 302	Mechanics of Materials		3
CEN 312	Mechanics of Materials Lab		0.5
PHY 114	Classical Physics II	4	
MTH 331	Probability		3
ENL 266	Technical Communications	3	
	General Education Requirement		3
		18	**15.5**
Third Year			
CEN 303	Fluid Mechanics	3	
CEN 313	Fluid Mechanics Laboratory		1
CEN 306	Structural Analysis	3	
CEN 309	Introduction to Transportation	3	
CEN 403	Soil Mechanics	3	
CEN 413	Soil Mechanics Laboratory	1	
CEN 310	Construction Materials Lab	0.5	
EGR 232	Principles of Thermodynamics	3	
CEN 304	Introduction to Environmental Engineering		3
CEN 307	Analysis and Design of Concrete Structures		3
CEN 314	Environmental Engineering Lab		1
CEN 311	Water Resources Engineering		3
CEN 423	Design of Foundations and Earth Structures		3
CEN 434	Traffic Engineering		3
		16.5	**17**
Fourth Year			
CEN 308	Analysis and Design of Steel Structures	3	
CEN 411	Water Quality Engineering	3	
CEN 402	Engineering Economy	3	
CEN 452	Ethical, Professional, and Safety Issues	1	
	Technical Electives		6
CEN 491	Civil Engineering Project*	1	2
	General Education Requirements (C)	3	3
	General Education Requirements (D)		3
	General Education Requirements (G)		3
		14	**17**
	Total Credits:		**127**

* two semester course, grades awarded in spring semester; one credit first semester; two credits second semester

Technical Electives

All Civil Engineering majors must complete a minimum of 2 technical elective courses. They will select these courses from the list below, according to a plan that is developed in consultation with the departmental advisor. In addition to the curriculum requirements, all Civil Engineering majors must take the Fundamentals of Engineering Exam by the Spring semester of their senior year.

Technical Electives

CEN 311 Water Resources Engineering
CEN 412 Pollution Control of Wastes
CEN 421 Matrix Methods of Structural Analysis
CEN 422 Design of Structural Systems
CEN 432 Pavement Design
CEN 433 Special Topics in Geotechnical Engineering
CEN 443 Computer-Aided Water Resources Design

Alternative Paths Program Requirements

Depending on the results of placement testing, new freshman students may be placed into one of the following first-year curricula in lieu of the standard curriculum.

		Semester Credits	
		First	**Second**
First Year Courses for Precalculus-Ready Freshmen			
ENL 101,102	Critical Writing and Reading I, II	3	3
CHM 151, 152	Principles of Modern Chemistry I, II	3	3
CHM 161, 162	Intro Applied Chemistry Engineers I, II	1	1
MTH 131	Precalculus	3	
MTH 111	Analytical Geometry and Calculus I		4
CEN 161	Civil Engineering Design Graphics	3	
CEN 252	Ethical, Professional, and Safety Issues		1
		13	**12**

		First	**Second**
First-Year Courses for Algebra-Ready Freshmen			
ENL 101, 102	Critical Writing and Reading I, II	3	3
CHM 151	Principles of Modern Chemistry I		3
CHM 161	Intro Applied Chemistry Engineers I		1
MTH 100	Basic Algebra	3*	
MTH 131	Precalculus		4
PHY 162	Science, Technology, and Society II: Environment	3	
CEN 161	Civil Engineering Design Graphics		3
	General Education Electives	6	
		15	**14**

* Students receive 3 administrative credits for Math 100. Administrative credits do not count towards the total credits required for graduation.

Civil and Environmental Engineering Courses

CEN 161 three credits
Civil Engineering Design Graphics
3 hours lecture, 3 hours laboratory
The standard graphical means of communication between the civil engineer and the constructor are introduced. The students' graphic communication skills are developed including the ability to use computer-aided graphic systems.

CEN 201 three credits
Surveying
3 hours lecture
A study of the theory and practice of plane surveying as applied to property, topographic, and engineering surveys, including curves, error theory and earth-work as related to civil engineering projects.

CEN 211 one credit
Surveying Laboratory
3 hours laboratory
Corequisite: CEN 201
Consists of field practice to understand and supplement the CEN 201 course contents.

CEN 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

CEN 302 three credits
Mechanics of Materials
3 hours lecture
Prerequisite: EGR 241
The behavior of materials and members under axial load, torsion, flexure, shear and combined loads, including the deflection of beams and buckling of columns. The relationship between stress and strain, principal stresses and strains and yield and fracture criteria are discussed.

CEN 303 three credits
Fluid Mechanics
3 hours lecture
Prerequisite: EGR 242
The mechanics of fluids, fluid properties, fluid statics. Kinematics and dynamics of flow fields are developed. Dimensional analysis, metering, laminar and turbulent flows will also be discussed. Emphasis is placed on energy equations with applications to closed conduit and open channel

Gen Ed note: Civil Engineering courses satisfy the Natural Science and Technology requirement.

flow problems. Boundary layer concepts and drag and lift forces on submerged bodies are also considered.

CEN 304 three credits
Introduction to Environmental Engineering
3 hours lecture
Prerequisites: CEN 303, CHM 152
Introduction to the sanitary engineering field. The environmental problems of urbanization and the natural cycle of water are discussed. Elementary hydrology, physical, chemical and biological principles of the treatment of water and wastewater are covered. Municipal services—water mains, sanitary sewers and storm water drainage, layout and operation of purification and treatment works are studied in detail. In addition, state and federal regulatory standards are introduced and discussed.

CEN 306 three credits
Structural Analysis
3 hours lecture
Prerequisite: CEN 302
Analysis of forces, moments, and deformations of determinate and indeterminate beams, fames, trusses, and other structural systems. Classical and computer methods used. (Formerly offered as CEN 321.)

CEN 307 three credits
Analysis and Design of Reinforced Concrete Structures
3 hours lecture
Prerequisite: CEN 306
The methods of structural analysis and design of reinforced concrete beams, columns, frames, and one-and two-way slabs are formulated and discussed.

CEN 308 three credits
Analysis and Design of Steel Structures
3 hours lecture
Prerequisite: CEN 306
The field of structural engineering is introduced through a study of the methods of structural analysis and design of steel structures using the Load and Resistance Factor Design Method.

CEN 309 three credits
Introduction to Transportation Engineering Systems
3 hours lecture
Prerequisites: CEN 201
A comprehensive overview of the characteristics of transportation systems. Concepts in major areas such as geometric design, human factors, traffic engineering simulation, and transportation planning and evaluation, including travel behavior and socioeconomic effects, will be introduced. Principles of highway construction and design will be included.

CEN 310 one-half credit
Construction Materials Lab
3 hours laboratory
Corequisite: CEN 309
A series of laboratory experiments aimed at measuring the engineering properties of asphalt, asphalt concrete and concrete to supplement the theory covered in CEN 309.

CEN 311 three credits
Water Resources Engineering
3 hours lecture
Prerequisite: CEN 303
Elementary surface and groundwater hydrology, pressure flow and open channel flow fundamentals. Topics include basic probability and statistics with a water resources emphasis, watershed based and site drainage concepts, natural and constructed open channel systems, reservoir routing and design, analysis and management issues. Also covered are the analysis and design of pressure flow systems, dam spillways, energy dissipaters and stilling basins. An integrated, systems analyses approach to water resources engineering is emphasized.

CEN 312 one half credit
Mechanics of Materials Laboratory
3 hours laboratory
Corequisite: CEN 302
Laboratory experiments conducted to investigate the physical characteristics of materials and to verify the assumptions made in the course Mechanics of Materials, CEN 302.

CEN 313 one credit
Fluid Mechanics Laboratory
3 hours laboratory
Corequisite: CEN 303
Laboratory experiments supplementing the theory course CEN 303 Fluid Mechanics, with the objective of introducing the student to the field of fluid observations and experimentation.

CEN 314 one credit
Introduction to Environmental Engineering Laboratory
3 hours laboratory
Corequisite: CEN 304
Laboratory experiments in the testing of water and wastewater. Supplements the theory course CEN 304.

CEN 400 three credits
Civil Engineering Internship
Training experience for civil engineering majors at various institutions/agencies recognized by the department. Internship proposals must be approved by the department chair.

CEN 402 three credits
Engineering Economy
3 hours lecture
Prerequisite: MTH 112
A study of the principles involved in the analysis of proposed investment in capital assets for decision-making. Emphasis is placed on techniques for economy studies of multiple alternatives, uncertainties in forecasts, increment costs, taxes, retirement and replacement. Current economic issues, overview of economic decision-making and investment are also discussed. Enrollment is normally limited to engineering seniors.

CEN 403 three credits
Soil Mechanics
3 hours lecture
Prerequisite: CEN 302
Corequisite: CEN 303
Physical and mechanical properties of soils including weight-volume relationships, index and classification properties, compaction, permeability and consolidation characteristics. Effective stresses and soil strength parameters are also discussed.

CEN 411 three credits
Water Quality Engineering
3 hours lecture
Prerequisite: CEN 304
Factors influencing the physical, chemical, and biological characteristics of surface and ground waters. Unit operations and processes related to water treatment are emphasized.

CEN 412 three credits
Pollution Control of Wastes
3 hours lecture
Prerequisite: CEN 411
The nature and causes of wastewater pollutants and the biological, chemical, and physical characteristics of these wastes. The analysis, treatment, and disposal of domestic, municipal, and industrial wastes are studied. Design of wastewater collection, pumping, and treatment facilities are practiced.

CEN 413 one credit
Soil Mechanics Laboratory
3 hours laboratory
Corequisite: CEN 403

Laboratory experiments in testing of various types of soils. Supplements the theory course CEN 403.

CEN 421 three credits
Matrix Methods of Structural Analysis
3 hours lecture
Prerequisite: CEN 306
Fundamental matrix algebra including inversion of matrices. Stiffness matrices for spring assemblages, trusses, beams, and planar frames. Introduction to flexibility method. Computer programs are used by students to solve matrix equations.

CEN 422 three credits
Design of Structural Systems
3 hours lecture
Prerequisite: CEN 307, 308
For students interested in a career in structural engineering, gives a basic understanding of the behavior of various two and three dimensional load carrying structural systems and also some means by which they can compare alternate structural systems. Design concepts, design assumptions, and methods of analysis are stressed. The selection of the optimum system for a particular type structure is also discussed.

CEN 423 three credits
Design of Foundations and Earth Structures
3 hours lecture
Prerequisite: CEN 403
Corequisite: CEN 307
The design of shallow foundations (spread footings and mat foundations), deep foundations (piles and drilled shafts), and retaining walls. Emphasis is placed on considerations of bearing capacity and, settlement and stability. The design of braced cuts and lateral earth support systems is also discussed.

CEN 432 three credits
Pavement Design
3 hours lecture
Prerequisite: CEN 309
Provides a comprehensive understanding of pavement design. Basic principles and various design methods of pavements will be introduced. Major topics to be covered are stresses in flexible and rigid pavements, AASHTO design method for flexible and rigid pavements, design of overlays, design of airports, and other design methods of flexible and rigid pavements.

CEN 433 three credits
Special Topics in Geotechnical Engineering
3 hours lecture
Prerequisite: CEN 403
Selected topics of special interest in geotechnical and geoenvironmental engineering. Topics will include geotechnical aspects of landfill design, design principals and uses of geosynthetics for drainage systems, separation, and soil reinforcement, slope stability analysis, and various other techniques for soil stabilization and site improvement.

CEN 434 three credits
Traffic Engineering
3 hours lecture
Prerequisite: CEN 309
Introduction to the concepts of movement control. Discussion and quantitative appraisal of the characteristics of the transport user, the vehicle, the road, the navigation and control systems. Written and oral reports are assigned on field data collections and evaluations of typical control problems, traffic studies, road user reactions, and potential future transport systems.

CEN 443 three credits
Computer-Aided Water Resources Design
3 hours lecture
Prerequisite: CEN 311
Explores the relationship of hydrology and hydraulics, with the ultimate goal of designing a project. The concepts of precipitation, runoff, and hydrograph analysis and synthesis are emphasized. Additional topics include frequency analysis, flood routing, hydrologic synthesis and simulation techniques for large basins as well as urban and small watersheds. Topics also included are: backwater curves, submerged weirs, and water hammer. All subjects are primarily focused in developing and designing a comprehensive hypothetical water-resources project with computer use as cornerstone.

CEN 452 one credit
Ethical, Professional, and Safety Issues
2 hours lecture
Course fee, to cover cost of OSHA training
The professional nature of engineering and the code of ethics which governs its practice. Safety issues pertaining to field practice by civil engineers are covered. Students learn to make competent on-the-job decisions and improve professional practice with an emphasis on safety for workers in the field. Requirements include completing an OSHA safety certification course, for which students pay a fee.

CEN 491 one credit in fall, two in spring
Civil Engineering Project
Prerequisites: Senior status
One credit in fall, two in spring
Final design experience requiring practitioner involvement, student reports, and oral presentations. An interdisciplinary, team approach is emphasized. Graded IP in fall.

CEN 495 variable credit
Independent Study
Prerequisites: Upper-division standing, permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

CEN 196, 296, 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged

Computer and Information Science

Faculty and Fields of Interest

Students who major in computer science are given a strong background in computer hardware and software, as well as a substantial amount of "hands-on" experience. They are prepared to work both in computer industry and business as well as pursue graduate studies in the discipline. Both major and minor programs are offered.

The undergraduate program is accredited by the Accreditation Board for Engineering and Technology (ABET), Computing Accreditation Commission.

Qualified computer science majors can benefit from the Cooperative Education program offered in cooperation with the local computer industry.

The CIS department also offers a Master of Science Degree in Computer Science with a broad range of required and elective courses in theoretical computer science, computer systems, software engineering, parallel and distributed computing, and computer networks. See the *Graduate Catalogue* for information.

Emad H. Aboelela computer networks, fuzzy systems

Ramprasad Balasubramanian computer vision, motion detection, image processing

Jan Bergandy distributed systems, software engineering, theoretical computer science

Paul Bergstein object-oriented programming, databases

Zenhai Duan computer networks, multimedia communications, network security, wireless networks

Eugene Eberbach evolutionary computing, concurrent systems, artificial intelligence

Robert Green software engineering, parallel architectures (on leave, associate provost for computer and information technology)

Boleslaw Mikolajczak (chairperson) algorithms and complexity, parallel and distributed processing, computer architecture, theoretical computer science

Richard Upchurch social implications, software engineering, human-computer interaction

Iren Valova artificial intelligence, neural networks, image processing

Xiaoqin Zhang multi-agent systems, intelligent agents, e-commerce

Faculty with Computer and Information Science Joint Appointment

Adam O. Hausknecht symbolic manipulators, foundations of computer science
Department of Mathematics

Department Mission

- To offer the strongest Bachelor of Science in Computer Science and ABET accredited program in the state of Massachusetts
- To offer graduate programs in Computer Science of intellectual rigor.
- To maintain Computer Science research programs appropriate to the University
- To meet regional and state needs through education, and industrial and community outreach
- To build a satisfying and career enhancing environment at UMD.
- To help build an interdisciplinary intellectual environment at UMD
- To maintain curricula to meet the computer fluency needs of all UMD students.

Program Goals

- Graduates who succeed as practicing computer scientists.
- Graduates who succeed in advanced study in computer science.
- Graduates who adapt and evolve in complex technological environments such as those found in the workplace.
- Graduates who influence the development of professional, ethical and legal aspects of computing.

Program Outcomes

To meet the program goals the Computer and Information Science Department, through its major in computer science, seeks to produce graduates who:

- are able to individually solve problems in algorithmic manner with given computer resources and constraints;
- apply their knowledge of mathematics, science and computer science to solve technical problems;
- apply analytic and empirical techniques to evaluate technical problems and their solutions;
- design system, component, or process to meet specified requirements;
- participate as a member of a multidisciplinary, problem solving team;
- identify, formulate, and solve problems encountered when constructing solutions involving information technology;
- articulate the social, professional, ethical and legal aspects of a computing milieu;
- evaluate the impact of computing and information technology at the global/societal level;
- analyze contemporary issues related to the evolving discipline of computer science;
- communicate effectively (needs to be understood as involving both orally and written, and include choosing and using the appropriate representations and/or media);
- apply modern skills, techniques, and tools during professional practice.

Alternative Paths Program Requirements

Depending on the results of placement testing, new freshman students may be placed into one of the following first-year curricula in lieu of the standard curriculum.

			Credits
First Year Courses for Precalculus-Ready Freshmen			
ENL 101	Critical Writing and Reading I		3
ENL 102	Critical Writing and Reading II		3
MTH 111	Analytical Geometry & Calculus I		4
MTH 131	Precalculus		3
CIS 180	Object-Oriented Programming		4
CIS 181	Programming Paradigms		4
	General Education Electives		6
		Total:	**27**
First-Year Courses for Algebra-Ready Freshmen			
ENL 101	Critical Writing and Reading I		3
ENL 102	Critical Writing and Reading II		3
MTH 100	Basic Algebra		3*
MTH 131	Precalculus		3
CIS 120	Web Page Development		3
CIS 180	Object-Oriented Programming		4
	General Education Electives		12
		Total:	**31**

* Students receive 3 administrative credits for Math 100. Administrative credits do not count towards the total credits required for graduation.

Computer Science Major
BS degree

A wide selection of courses offers experience in software engineering, computer languages, artificial intelligence, compilers, computer networks, operating systems, computer architecture, computer graphics, parallel computing, human computer interaction and data bases, as well as theoretical aspects. The undergraduate computer science curriculum is object-oriented, lab intensive, and directed toward software development. The courses are supported by a network of state-of-the-art workstations and various specialized laboratories.

The Computer Science bachelor's degree program is accredited by the Computing Accreditation Commission of the Accreditation Board of Engineering and Technology (CAC/ABET, www.abet.org).

Computer Science majors must fulfill the requirements shown in the chart to the right. In addition, all Computer Science majors must complete the CIS Department Exit Survey in their final semester.

General Education Departmental Requirements

Students majoring in Computer Science will meet their departmentally-controlled General Education requirements as follows:

Area E: Satisfied by CIS 381
Area I, Tier 2: Satisfied by any CIS course above CIS 110
Area W, Tier 2: Satisfied by ENL 266
Area O: Satisfied by CIS Technical Electives, CIS 362 and 480

Requirements

		Credits
1. *Complete the following CIS core courses, each with a grade of "C" or better.*		
CIS 180	Object-Oriented Programming	4
CIS 181	Programming Paradigms	4
CIS 190	Introduction to Procedural Programming	4
CIS 272	Introduction to Computing Systems	4
CIS 273	Computer Organization and Design	4
CIS 280	Software Specification and Design	4
CIS 360	Algorithms and Data Structures	3
CIS 361	Models of Computation	3
CIS 370	Design of Operating Systems	4
CIS 480	Software Engineering	4
CIS 481	Parallel & Distrib. Software Systems	3
2. *Complete four additional courses from the following CIS technical electives, each with a grade of 'C' or better:*		
CIS 314	Computer Architecture	4
CIS 410	Programming Language Design	3
CIS 412	Found. Artificial Intelligence	3
CIS 421	Intro. Theory of Computing	3
CIS 422	Design of Parallel Algorithms	4
CIS 430	Data Mining and Knowledge Discovery	3
CIS 431	Human-Computer Interaction	4
CIS 452	Database Systems	3
CIS 454	Computer Graphics	3
CIS 465	Topics in Computer Vision	3
CIS 467	Image Analysis and Processing	3
CIS 471	Compiler Design	3
CIS 475	Computer Networks	3
CIS 476	Network Programing	3
CIS 490	Machine Learning	3
3. *Complete the following Mathematics Requirements:*		
MTH 111,112	Analytical Geometry & Calculus I, II	8
MTH 181,182	Discrete Structures I, II	6
MTH 331	Probability	3
4. *Complete the following Science/Quantitative courses:*		
PHY 113, 114	Classical Physics I, II (4, 4)	8
	OR	
CHM 151,152	Principles of Modern Chemistry I, II (3, 3)	
CHM 161,162	Introduction to Applied Chemistry I, II (1, 1)	
	OR	
BIO 121,122	Biology of Organisms I, II (3, 3)	
BIO 131,132	Biology of Organisms Laboratory I, II (1, 1)	
	AND	
CIS 362	Empirical Methods for Computer Science	3
	Science/Quantitative course	3
5. *Complete the General Education requirements and free electives:*		
Writing, Tier 1 and Tier 2; Information, Tier 1		
ENL 101, 102	Critical Writing and Reading I, II	6
ENL 266	Technical Communications	3
Ethics and Cultural Responsibility		
CIS 381	Social and Ethical Aspects of Computing	3
Cultural and Artistic Literacy		9
Global Awareness		3
Diversity		3
Free electives		9
Program Total		**at least 120**

Computer Science Minors

Students interested in a minor should contact the CIS department for an application and admission requirements. The department offers three different minors, each with the emphasis indicated. Each requires credits as specified below.

Admission to one of the minors

Students must meet the university's admission requirements for a minor, which include having completed 54 credits. For computer science, prospective minors are encouraged to inquire and plan their minor program prior to earning 54 credits, because the structure of requirements could necessitate the use of more than four semesters. Courses completed prior to formal declaration will count toward the minor program.

Admission to the minor is accomplished through an application form available in the office of the chairperson of the department accompanied by current transcript(s). Upon acceptance the student is assigned an advisor, who works with the student to design an individual minor program that meets the stated requirements. Study plans are to be approved by the department chairperson.

Computer Science

Objectives

1. To develop in the student an understanding of computer science as a discipline, its structure, methodologies, and trends.
2. To use the computer as a tool to solve problems.
3. To give the student a sufficient background in computer science to continue his/her study of the discipline independently.
4. To give students a sufficient knowledge in computer science to gain an advantage when entering the current job market.

Requirements

Complete the following courses with a grade of C or better:

		credits
CIS 180	Object-Oriented Programming	4
CIS 181	Programming Paradigms	4
CIS 280	Software Specif. & Design	4
CIS 360	Algorithms & Data Structures	3
CIS 361	Models of Computation	3
CIS	One additional 300/400 course	3
	Total	21

Students with prior experience in programming can substitute CIS 183 Object Paradigm for the sequence of courses CIS 180/181. Students can substitute the sequence CIS 115 Computer Programming in C / CIS 215 Program Design and Data Structures for the sequence CIS 180 / 181.

Software Engineering

Objectives

1. To develop in the student the ability to use software development methodologies and software processes to participate in the design and implementation of software systems.
2. To teach the student how to design and implement software.
3. To give the student a sufficient background in software engineering to continue his/her study of the discipline independently.
4. To give students a sufficient knowledge in software engineering to gain an advantage when entering the current job market.

Requirements

Complete the following courses with a grade of C or better:

		credits
CIS 180	Object-Oriented Programming	4
CIS 181	Programming Paradigms	4
CIS 280	Software Specif. & Design	4
CIS 480	Software Engineering	4
CIS 481	Parallel & Distr. Softw. Systems	3
CIS	One additional 300/400 course	3
	Total	22

CIS 480 has as a prerequisite CIS 362 Empirical Methods. Students without a knowledge of empirical methods equivalent to CIS 362 must take that prerequisite course.

Students with prior experience in programming can substitute CIS 183 Object Paradigm for the sequence of courses CIS 180/181.

System Software

Objectives

1. To develop in the student the ability to use computer systems and system software and participate in the design and implementation of operating systems and computer networks.
2. To give the student a sufficient background in systems software to continue his/her study of the discipline independently.
3. To give students a sufficient knowledge in operating software and computer networks to gain an advantage when entering the current job market.

Requirements

Complete the following courses with a grade of C or better:

		credits
CIS 115	Computer Programming with C	3
CIS 215	Program Design/Data Str. w/ C	3
CIS 272	Intro. to Computing Systems	4
CIS 273	Computer Organization and design	4
CIS 370	Design of Operating Systems	4
CIS 475	Computer Networks	3
CIS	One additional 300/400 course	3
	Total	24

Gen Ed note: Computer Science courses satisfy the Natural Science and Technology requirement.

Computer and Information Science Courses

CIS 110 three credits
Computer Literacy
An introduction to computers, evolution of computer systems and the impact of computers on the society. In this hands-on laboratory course, students will use Macintosh computers to learn about components of computer systems and study various applications including word processing, spreadsheet, database, presentation and internet browsing software. With the HyperCard, students will learn how to design and program in the multimedia environment. Each student will then use this knowledge to develop an individual final project for the course.

CIS 115 three credits
Computer Programming with C
Algorithm development, syntax and semantics of a high level programming language, debugging and verification of programs. Concepts of structured programming. Arrays, subroutines. Elementary system concepts (compilation, time-sharing).

CIS 161 three credits
Computer Programming BASIC
An elementary programming course in the BASIC programming language, designed for the student with no prior experience in data processing.

CIS 120 three credits
Web Page Development
An introduction to the theory and application of creating web pages using HTML and JavaScript. HTML is the underlying structure used by the World Wide Web and will be used in this course along with JavaScript to assist students in building a foundation to become proficient in designing web pages. The primary theme of the course is learning how to create web pages that are attractive, meaningful, and well designed. Assessment of achieving these goals also will be addressed. As time allows, DHTML (Dynamic HTML), XML and Java applets may be used.

CIS 180 four credits
Object-Oriented Programming I
3 hours lecture; 2 hours laboratory
Basic concepts in programming, and introduction to the object paradigm. The course introduces the concept of the object paradigm and teaches how to design and implement simple programs in an object-oriented language. The course also covers the basics of how to use a computer and basic software tools, including libraries of components, in the process of developing programs.

CIS 181 four credits
Object-Oriented Programming II
3 hours lecture; 2 hours laboratory
Prerequisite: CIS 180
Software development using advanced object paradigm concepts. This course introduces threads, networking, and exception handling and covers in depth the advanced topics of object paradigm such as inheritance and polymorphism. These concepts are introduced in the context of developing software using software tools including the libraries of components.

CIS 183 four credits
Object-Oriented Paradigm
3 hours lecture; 2 hours laboratory
Introduction to the object paradigm. Software development using advanced object paradigm concepts of inheritance and polymorphism. Introduction to concurrency, and faulty tolerance. Developing software using software tools including the libraries of components. Comparison of procedural and object paradigms. Introduction to programming with multiple processes and with exception handling.

CIS 190 four credits
Introduction to Procedural Programming
3 hours lecture; 2 hours laboratory
Prerequisite: CIS major
Procedural Programming (C/C++) under Unix. Data types, variable declarations, arithmetic expressions, conditional statements, macros, function prototypes, standard libraries, file processing, pointers, structures, unions, and dynamic memory management are discussed. Unix file system, shell scripts, input/output redirection, piping, programming with standard I/O, and unix system calls are covered.

CIS 215 three credits
Program Design and Data Structures With C
Prerequisite: CIS 115
Program design issues, abstract data types, procedural and data abstraction issues. The following data structures are explored: linked lists, stacks, queues, binary trees, tables. Procedural abstractions such as: functions, recursive functions with variable number of parameters, are further discussed. Features of the C programming language such as: preprocessor, macros, standard libraries, and programs with files are discussed.

CIS 261 three credits
Computer Programming, FORTRAN
An intensive course in the FORTRAN programming language.

CIS 265 three credits
Program Design and Data Structures with C
Prerequisite: Any Programming Course
An intensive course in the "C" programming language with introduction to UNIX for students who are already proficient in another high-level programming language such as BASIC, FORTRAN, or PASCAL.

CIS 266 three credits
Object-Oriented Programming in C++
Prerequisite: Any programming course
Fundamental conceptual tools and their implementation of object-oriented design and programming such as: object, type, class, implementation hiding, inheritance, parametric typing, function overloading, polymorphism, source code reusability, and object code reusability. Object-Oriented Analysis/Design for problem solving. Implementation of Object-Oriented Programming paradigm is illustrated by program development in C++.

CIS 272 four credits
Introduction to Computing Systems
3 hours lecture; 2 hours laboratory
Prerequisite: CIS 190
Corequisite: MTH 181
Introduction to major components of computer system software. The course introduces fundamental concepts of computing systems, such as binary arithmetic and data representation, the Von Neumann model for processing computer programs, the operation of memory, instruction set, and machine and assembly language programming. It systematically presents the levels of transformations from machine language to assembly language to high level language. The role of such systems software components as assemblers, compilers, linkers, loaders, and operating systems is studied. The course has a strong project component.

CIS 273 four credits
Computer Organization and Design
3 hours lecture; 2 hours laboratory
Prerequisite: CIS 190
Corequisite: MTH 181
Laws of computer organization and design for RISC architectures. Interfaces between hardware and software are studied. Influence of instruction set on performance is presented. Design of a processor with pipelining is analyzed. Computer arithmetic is studied. Memory hierarchy and their influence on performance is documented.

Elements of interfacing and I/O organization are included. The course has a design, implementation, and analytical components. (Formerly offered as CIS 270)

CIS 280 four credits
Software Specification and Design
3 hours lecture; 2 hours laboratory
Prerequisite: CIS 272
Object-oriented analysis and design: methodologies and tools. The course focuses on methodologies of specification and design of software systems. It addresses the issues of user interface design and software prototyping. The course also presents the state of the art in the tool and environments supporting the front end of the software development cycle.

CIS 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

CIS 314 four credits
Computer Architecture
Prerequisite: CIS 273, 360
General organization of a computer system. Memory hierarchy. Emphasis on memory organization and management implementation. Local and long distance communication, bus, input-output organization and control. Programmed I/O and I/O processors. Interrupt handling. Processor organization; instruction set; arithmetic-logic unit; parallel and stack processors. Programmed and hardwired, central and distributed control.

CIS 360 three credits
Algorithms and Data Structures
Prerequisite: CIS 181
Comprehensive coverage of all major groups of algorithms, including divide-and-conquer, dynamic programming, greedy, backtracking, branch-and-bound, and parallel algorithms. Discussion of the design and implementation of complex, dynamic data structures. The course also covers an introduction to the functional paradigm.

CIS 361 three credits
Models of Computation
Prerequisites: CIS 181, MTH 182
Models of sequential, parallel, and distributed computations. The Chomsky hierarchy of formal languages and their accepting machines are studied in detail. The relationship of these languages and machines to computer programs is presented. Influence of a Turing machine and related formalisms on modern computing are studied. Decidability of decision problems is explained. Several models of parallel and distributed computations are introduced and compared.

CIS 362 three credits
Empirical Methods for Computer Science
Prerequisite: MTH 331
Topics and methods supporting an experimental approach to the study of issues in computer science and software engineering. Course covers the basic principles of experimental design and case study construction. Emphasis in the course is on the use of empirical methods for decision making and the evaluation of research in computer science and software engineering that employ empirical methods.

CIS 370 four credits
Design of Operating Systems
3 hours lecture; 2 hours laboratory
Prerequisite: CIS 273
Principles of modern operating systems and their design. Scientific principles and engineering rules of operating systems are explored. Process and storage management subsystems are analyzed in detail. Protection and security are taken into account in design. An introduction to distributed operating systems is also presented. This is a design and project based course with a laboratory component.

CIS 381 three credits **E**
Social and Ethical Aspects of Computing
Prerequisite: Junior standing
Introduction to the social, legal, and ethical issues of computing. Topics include how computer use affects social and work relationships and the uses of computers in society. These will be reviewed in the context of risks, privacy and intrusion, computer crime, intellectual property, and professional decision-making. Students analyze scenarios that allow them to view ethical decision-making as a crucial part of understanding the world of computing.

CIS 410 three credits
Programming Language Design
Prerequisite: CIS 360
Fundamental concepts and general principles underlying current programming languages and models. Topics include control and data abstractions, language processing and binding, the relationship between language design and language implementation. A variety of computational paradigms are discussed: functional programming, logic programming, object-oriented programming, and procedural programming.

CIS 411 three credits
Seminar
Prerequisite: Senior CIS standing
Advanced topics in Computer Science.

CIS 412 three credits
Artificial Intelligence
Prerequisite: CIS 360 or permission of instructor
Artificial intelligence problem-solving paradigms. The course covers heuristic versus algorithmic methods, rational and heuristic approaches, and description of cognitive processes; and objectives of work in artificial intelligence, the mid-brain problem and nature of intelligence, simulation of cognitive behavior, and self-organizing systems. Examples are given of representative applications.

CIS 421 three credits
Introduction to the Theory of Computing
3 hours lecture
Prerequisite: CIS 361
Several of the most significant models of computation will be reviewed, i.e., Turing machines, 1-calculus, predicate calculus. The traditional undecidibility results will be covered, along with the attempts to overcome the resulting limitations in restricted situations. Mechanical theorem provers will be considered. The resolution and unification predicate calculus methods will be discussed along with appropriate PROLOG programming assignments. The Boyer-Moore approach will be discussed, along with LISP programming assignments.

CIS 422 four credits
Design of Parallel Algorithms
3 hours lecture, 2 hours laboratory
Prerequisite: CIS 360 or permission of instructor
Design and analysis of algorithms for parallel computers with two modes of operation: shared memory, and message passing. Synchronous and asynchronous parallel algorithms for the following problems will be designed and implemented: selection, merging, sorting, searching, generating permutations and combinations, and matrix operations.

Parallel computational complexity of these algorithms will be analyzed.

CIS 430 three credits
Data Mining and Knowledge Discovery
Prerequisite: CIS 360
Designed to provide students with a solid background in data mining and knowledge discovery concepts, tools, and methodology, as well as their applicability to real world problems. A variety of data mining techniques will be explored including memory-based reasoning, cluster detection, classification, neural networks, and finding understandable knowledge in large sets of real world examples. Some related topics such as web and multimedia mining will be discussed. Students will gain hands-on experience in data mining techniques using various data mining software packages and tools.

CIS 431 four credits
Human-Computer Interaction
3 hours lecture; 3 hours laboratory
Prerequisite: CIS 362 or permission of instructor
Theory and principles for constructing usable software systems. Cognitive and effective aspects of users. The impact of user characteristics on design decisions. The construction and evaluation of the user interface. Sensory and perceptual aspects of interfaces, task structure, input modalities, screen layout, and user documentation. Individual concerns for systems such as personal productivity tools, real-time control systems, instructional software, and games.

CIS 452 three credits
Database Systems
Prerequisite: CIS 280
Use of DBMS software in the development of an information system. Overview of the ANSI/SPARC Study Group on Database Management Systems model. Relational database model techniques. Emphasis on user views necessary to support data management and retrieval.

CIS 454 three credits
Computer Graphics
Prerequisite: At least junior CIS standing
Graphics devices. Two dimensional and three dimensional image representations and transformations. Graphics systems software architecture; graphics standards; packages.

CIS 465 three credits
Topics in Computer Vision
Prerequisite: CIS 360 or permission of the instructor
Foundations of computer vision. Image formats, projection models, regions, filters, edge detection, segmentation, shape description and representation, object recognition and understanding, and stereo-vision are discussed.

CIS 467 three credits
Image Analysis and Processing
Prerequisite: CIS 360 or permission of the instructor
Fundamentals in image analysis and processing. Topics in image processing such as display and filtering, image restoration, segmentation, compression of image information, warping, morphological processing of images, wavelets, multi-resolution imaging and unitary transforms are discussed.

CIS 471 three credits
Compiler Design
Prerequisite: CIS 361
Organization of a compiler including lexical and syntax analysis, symbol tables, object code generation, error detection and recovery, code optimization techniques, and overall design. Compilation techniques and run-time structures in block-structured language.

CIS 475 three credits
Computer Networks
Prerequisites: CIS 370
Topology of computer networks. Physical transmission. Error handling. Protocols. Satellite, packet radio, and local networks. Network interconnection. Security. Applications of computer networks.

CIS 476 three credits
Network Programming
Prerequisite: CIS 370
Introduction to computer networks, and methods for programming network services and applications. The course covers the Internet protocol suite (e.g. IP, TCP, UDP), socket programming, and client-server design (e.g. connectionless, connection oriented, multiprotocol). The course discusses the implementation of real-time applications (e.g. streaming audio and video), and application -level gateways and tunneling. In addition, the course addresses protocol implementation using routing sockets and raw sockets. Programming projects represent a significant component of the course.

CIS 480 four credits
Software Engineering
3 hours lecture; 2 hours laboratory
Prerequisite: CIS 280, 362
Software engineering models and processes; total quality management. The course will address the technical, logistical, and social issues associated with the software development process. It will cover the issues of total quality management at the team and enterprise levels.

CIS 481 three credits
Parallel and Distributed Software Systems
Prerequisite: CIS 280, 370
Parallelism and distribution of processing; software bus concept; patterns in software design. The course provides an in-depth discussion of the software systems wit multiple processes and of the relationship between concurrency and distribution of processes. The concept of the software bus, the existing standards, and the issues associated with their implementation are covered.

CIS 490 three credits
Machine Learning
Prerequisite: CIS 360
Constructing computer programs that automatically improve with experience is the main task of machine learning. The key algorithms in the area are presented. Learning concepts as decision trees, artificial neural networks and Bayesian approach are discussed. The standard iterative dichotomizer (ID3) is presented, the issues of overfitting, attribute selection and handling missing data are discussed. Neural nets are discussed in detail, examples of supervised and unsupervised learning are presented. Instance-based learning, i.e. k-nearest neighbor learning, case-based reasoning are introduced. Genetic algorithms are discussed on introductory level.

CIS 491, 492 three credits each
Honors Project I, II
Prerequisites: Junior standing, eligible for department honors program
The project courses required for completion of the departmental honors program. A significant experience in developing a computer system (typically), but equivalent alternatives are allowed. This system should require an extensive design effort prior to implementation and a serious effort for this implementation. It should have scholarly and/or practical value and might well profit by being interdisciplinary in nature.

CIS 495 variable credit
Independent Study

Note: Some graduate courses may be open to undergraduates. Please consult your department chairperson. See the *Graduate Catalogue* for graduate general and program requirements.

Prerequisites: Upper-division standing, permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

CIS 196, 296, 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Graduate Courses in Computer Science

CIS 521 three credits
Computability Theory
Prerequisite: CIS 361 or permission of instructor
Computability of sets and functions in terms of various computation models, Church-Turing thesis. Systems of recursion equations and Post canonical systems are studied. Properties of the classes of recursive functions, recursive sets, and recursively enumerable sets are also covered.

CIS 522 three credits
Algorithms and Complexity
Prerequisite: CIS 360 or permission of instructor
Evaluation of algorithms concerning their time and space complexity. Complexity hierarchies, axiomatic approach to computational complexity, NP complete problems, approxi-mation algorithms for these problems.

CIS 525 three credits
Parallel and Distributed Software Development
Prerequisite: CIS 361 or permission of instructor
Design and development of parallel and distributed systems. This course provides state-of-the art presentation of software development for parallel and distributed systems. A systematic model-based approach has been applied across stages of software development. Various versions of Petri nets are used to model , specify, validate, and verify correctness of parallel and distributed systems. Performance is also assessed based on stochastic Petri nets. Rapid prototyping of parallel and distributed systems with automatic code generation is an ultimate goal of his course. Comparison with other approaches is also provided.

CIS 526 three credits
Functional Programming and Type Theory
Prerequisite: CIS 360 or permission of instructor
Introduction to logic, type theory, and the lambda calculus. The course examines LISP as a first application of these ideas, consistency proofs using cut elimination and type theory, and constructive type of theory in functional programming languages in attempts to achieve program verification and automatic code generation.

CIS 531 three credits
Software System Specification
Prerequisite: CIS 480 or equivalent
Formal foundation of the theory and practice of software specification; production of correct, consistent, and reliable software systems by expressing the requirements of the system in formal ways. Formal and informal requirements analysis and specification techniques, the relation of analysis and specification to concerns of validation and verification, maintenance, and reusability.

CIS 532 three credits
Software Systems Design
Prerequisite: CIS 480 or equivalent
Principles and techniques for obtaining an architectural design from a system specification. Where appropriate, automated software design tools are used to demonstrate particular methodology. The relation of various design methods to the production of quality software that meets its specification, and the relation of design method to other life-cycle aspects. Design methods, design tools, the design process, and particular application domains for design techniques.

CIS 543 three credits
Software Systems Design with ADA
Prerequisite: CIS 443 or permission of instructor
Software engineering principles and methodologies. Also considered are issues related to the life cycle of large systems developed in ADA, software engineering of real-time, fault-tolerant and distributed systems, and software reuse.

CIS 545 three credits
Programming Languages
Prerequisite: Permission of instructor
Techniques of formal definition of programming languages, semantics of programming languages, programming styles, and language effects on software production. Introduces current trends in programming such as language features of problem-oriented and object-oriented programming, and analysis and design of user-oriented application languages.

CIS 552 three credits
Database Design
Prerequisite: CIS 452 or permission of instructor
The relational, hierarchical, and network approaches to database systems, including relational algebra and calculus, data dependencies, normal forms, data semantics, query optimization, and concurrency control on distributed database systems.

CIS 554 three credits
Advanced Computer Graphics
Prerequisite: CIS 454 or permission of instructor
Three-dimensional graphics including: color, shading, shadowing and texture, hidden surface algorithms. An extensive project will be assigned, including documentation and presentation.

CIS 560 three credits
Theoretical Computer Science
Prerequisites: CIS 360, 361, or equivalents
Theoretical basis of the development of computer science. The course details particular formalisms used in the design of hardware and software systems. Intrinsic limitations of computation are described. Advanced topics of automata theory and analysis of algorithms are included. The course also covers Turing machines, the halting problem, models of computation, intractable computations, polynomial reductions, P vs. NP, parallel algorithms, various formal descriptions and specifications of programs and computations, and proofs of program correctness and interactive proof systems.

CIS 561 three credits
Artificial Intelligence
Expert system architectures: forward-production, logic programming, deductive retrieval, and semantic network systems. The course also treats natural language systems, illustrative working systems, and AI pro-gramming.

CIS 563 three credits
MultiAgent Systems
Introduction to multiagent systems and

distributed artificial intelligence. The course examines the issues that arise when groups or societies of autonomous agents interact to solve interrelated problems. Topics include defining multiagent systems and their characteristics, reasoning about agents' knowledge and beliefs, distributed problem solving and planning, coordination and negotiation, the organization and control of complex, distributed multiagent systems, learning in multiagent systems, and applications in the following domains: internet information gathering, electronic commerce, virtual markets, workflow management, distributed sensing network, distributed planning and resource allocation.

CIS 564 three credits
Mobile Robotics
Prerequisite: Graduate standing
The theory, software and hardware for autonomous mobile robots. Reactive behavior-based, deliberative goal-based, and utility-based robotic architectures will be presented. Control and planning under bounded resources will be covered. Interaction with environment using sensors and actuators, robot kinematics and dynamics, reinforcement and evolutionary learning techniques for intelligent robots, interaction of competing and cooperating multi-robot systems will be presented. Various applications of mobile robots will be explored.

CIS 565 three credits
Evolutionary Computation
Prerequisite: Graduate standing
Presentation of evolutionary algorithms and comparison to traditional solving techniques. This course deals with a powerful new technique for solution of hard, intractable real-world problems, based on principles of natural evolution. Four main areas of evolutionary computation will be explored: genetic algorithms, genetic programming, evolution strategies, and evolutionary programming. Applications of evolutionary computation to related areas of computer science will be discussed.

CIS 566 three credits
Theory of Linear and Integer Programming and Computer Applications
Prerequisite: CIS 360 or permission of instructor
Basics of the simplex algorithm, tableaux, artificial variables, the two-phase method, the dual problem and its economic interpretation, primal-dual relationships and method. Also studied are applications to transportation problems and network flows, the polynomial methods of Khachiyan and Karmarkar, and integer programming. Computer methods and exercises will be employed throughout.

CIS 570 three credits
Advanced Computer Systems
Prerequisite: CIS 314 or equivalent
In depth treatment of current computer systems, with performance issues at the center of an analytical approach. The course explores operating system software and the interrelation between architecture and system software. Advanced topics of compiling, assembly, linking and loading of high-level language software are included. The course treats mechanisms of IO and the memory hierarchy, various features of traditional machines, advanced features of modern machines such as RISC and multiprocessor machines, and file systems and networked and distributed systems such as inter- and intra-nets. Throughout, performance issues are at the center of an analytical approach.

CIS 571 three credits
Compiler Construction
Prerequisite: CIS 471 or permission of instructor
Different techniques for lexical analysis, syntax analysis, and object code generation. Emphasis on code optimization techniques and compiler-construction tools. The course will include a significant project.

CIS 572 three credits
Real Time Systems
Prerequisite: CIS 481 or permission of instructor
Design and implementation of real-time systems. Implementation of real-time system in ADA, scheduling, fault tolerance, and distributed real-time systems are also studied.

CIS 573 three credits
Operating Systems
Prerequisite: CIS 370 or permission of instructor
The methodologies of operating systems design and implementation. Concurrency, synchronization, process communication, switching control, deadlocks, implementation of dynamic structures, design of operating systems modules and interfaces, system security and integrity, and system updating and documentation are also studied.

CIS 574 three credits
Advanced Computer Architectures
Prerequisite: CIS 314 or permission of instructor
Study of recent advances in computer organization. Parallel processors, pipelined processors, modular and network architectures data-flow machines, fault-tolerant systems, language-directed, object-based, capability-based, and message-based processor organizations.

CIS 575 three credits
Parallel Algorithms and Parallel Architectures
Prerequisites: CIS 314, 360; or permission of instructor
Parallel algorithms and their implementations in parallel architectures. In the first part of the course parallel algorithms are analyzed for problems in graph theory, algebra, FFT, and artificial intelligence. The second part presents implementations of these algorithms in various parallel architectures.

CIS 577 three credits
Computer Networks
Prerequisite: CIS 475 or permission of instructor
Analysis and modeling of centralized and distributed computer networks. Queuing network analysis, principles of network design, software considerations, and design of computer networks are also studied.

CIS 578 three credits
Evaluation of Computer Systems Performance
Prerequisite: MTH 331, CIS 314; or permission of instructor.
Techniques of analysis and simulation for evaluation of computer systems performance. Queuing systems, Poisson processes, scheduling, service distribution, conservation laws, queuing networks, and discrete simulations are also studied.

CIS 579 three credits
Multimedia Networking
Prerequisite: CIS 475 or 476
Current techniques in multimedia communications and networking. The course presents the communication requirements of the different types of multimedia applications, the operation of the different underlying communication networks as multimedia carriers, and the communication protocols associated with these networks and gives an overview of the various quality-of-service models, real-time transmission issues, and compression techniques.

CIS 580 three credits
Paradigmatic Software Development
Prerequisite: CIS 311 or equivalent
Software development in the context of various paradigms. The strategies and methods of the procedural, object-oriented, and functional paradigms are studied and practiced. The modeling of software processes will be considered from both the process and product views, as will the appropriateness and measures of effectiveness of these processes in the design of software systems. Students will apply these measures to the course exercises, determining and reviewing the impact of these methods on individual design.

CIS 581 three credits
Design and Verification of Information Systems
Prerequisite: CIS 580 or permission of instructor
Sound design methodologies and technologies in development and maintenance of information systems/business systems with special emphasis on workflow management systems. An applied course that emphasizes the formal approach, this course also addresses issues of adaptability and flexibility of information systems and their evaluation. The course supports concurrent execution of information systems during the design stage and adopts and applies various forms of Petri nets.

CIS 585 three credits
Image Processing and Machine Vision
Prerequisite: Graduate standing and permission of the instructor
Foundations of image processing and machine vision. Students apply and evaluate topics such as edge detection, segmentation, shape representation, and object recognition. Stereo vision and motion analysis will be covered in detail including calibration, range images, change detection, motion correspondence, and 2-D and 3-D tracking. Important research papers will be discussed in class.

CIS 588 three credits
Neural Computing
Prerequisite: Any course in programming languages and data structures
Fundamentals of artificial neural networks including application needs for neural networks, discussing the various architectures, learning algorithms and examples of applications. The standard neural networks are discussed in greater details, which allows for branching of architectures and combining of strategies for growing and/or constructing neural networks.

CIS 595 three credits
Independent Study
Prerequisites: Upper-division standing; permission of instructor, graduate director, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

CIS 596 three credits
Directed Study
Prerequisites: Permission of the instructor, graduate director, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

CIS 600 three credits
Master's Project
Prerequisites: CIS 560, 570, and 580
Provides an experience in the development of a detailed, significant project in computer science under the close supervision of a faculty member, perhaps as one member of a student team. This project may be a software implementation, a design effort, or a theoretical or practical written analysis. Public presentation of the master's project and evaluation by two faculty other than the project supervisor are required.

CIS 601, 602, 603 three credits each
Special Topics
Offered as needed to present advanced material to graduate students.

CIS 690 three credits
Master's Thesis
Prerequisite: Permission of the Graduate Program Committee, based on performance in CIS 600, approval of proposed topic, and support of a faculty advisor and two faculty readers.
Research leading to submission of a formal thesis. This course provides an optional thesis experience, which may be based on the student's Project in a more intense form or be a sequel effort of a different character. In exceptional circumstances, the student may earn up to six thesis credits, if approved by the Graduate Program Committee. Graded A-F.

Electrical and Computer Engineering

Faculty and Fields of Interest

The Department of Electrical and Computer Engineering (ECE) offers undergraduate programs of study leading to a Bachelor of Science degree in either Electrical Engineering or Computer Engineering. Both undergraduate programs are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

At the graduate level, the ECE Department offers programs leading to a Master of Science degree in either Electrical Engineering or Computer Engineering and a Doctor of Philosophy degree in Electrical Engineering with options in Electrical Engineering and Computer Engineering. In addition, the ECE Department offers five graduate certificate programs. For details consult the Bulletin of the Graduate School.

David A. Brown acoustic transduction, transducer devices and arrays, underwater acoustics, fiber optic sensors and systems, acoustic properties of materials, ocean and marine science and technology

John R. Buck underwater acoustics, signal processing, marine mammal bioacoustics

Chi-Hau Chen pattern recognition, neural networks, image processing and machine vision, communications theory, ultrasonic NDE

Lester W. Cory rehabilitation engineering, small computer systems, HF/VHF communications

Antonio H. Costa (chairperson) time-frequency representations, spectral estimation, signal processing, image processing, digital communications

Thomas J. Curry signal processing, computer systems, underwater systems

Lee E. Estes electro-optics, underwater systems, ocean optics, remote sensing

Gilbert Fain ocean systems, underwater communication and tracking, instrumentation measurement systems

Paul J. Fortier database systems, real-time systems, operating systems, computer architecture, computer networks, computer performance evaluation

Robert C. Helgeland marine electronic systems, computer-aided circuit analysis

Dayalan P. Kasilingam remote sensing, applied electromagnetics, wireless communications, adaptive signal processing

Gerald J. Lemay power systems, sustainability, renewable energy

Hong Liu computer networks, compilers, programming languages

Howard E. Michel distributed artificial intelligence, artificial neural networks, distributed computing, computer vision, computer networks

Theophano Mitsa knowledge-based systems, intelligent agents, distributed systems, internet computing

Steven C. Nardone systems theory, control and estimation theory, fuzzy systems, applications to target tracking

Branislav M. Notaros computational electromagnetics, antennas, microwaves

Karen L. Payton digital signal processing, speech processing, speech acoustics, auditory perception

Nixon A. Pendergrass digital signal processing, adaptive signal processing, communications theory, estimation theory

David Rancour semiconductor devices, VLSI, quantum mechanics

Dean J. Schmidlin digital signal processing, linear discrete-time systems (both time-varying and time-invariant)

Philip H. Viall computer networks, assembly languages, rehabilitation engineering

Liudong Xing hardware and software reliability, network reliability, fault-tolerant computing, risk assessment

Mission Statement

The Department of Electrical and Computer Engineering provides excellent undergraduate and graduate education in electrical and computer engineering, develops new ideas and technologies, and supports economic growth in the Commonwealth of Massachusetts and beyond.

Vision Statement

The Department of Electrical and Computer Engineering will continue to provide outstanding undergraduate and graduate education in electrical and computer engineering with graduate programs driven by excellence in research.

Educational Objectives

The undergraduate programs in Electrical Engineering and Computer Engineering have the following educational objectives:

1
To graduate students trained in the fundamental sciences and mathematics with the general breadth and depth necessary for engineering and engineering design.

2
To graduate students possessing effective communications, teamwork, and leadership skills.

3
To graduate students able to adapt to and influence the future technological environment in response to industrial and global changes.

4
To graduate students aware of the ethical, social, and environmental impact of their professional actions.

5
To graduate students prepared for computer or electrical engineering careers and continuing education including graduate school, self study, and industrial short courses.

Program Outcomes

The undergraduate programs in Computer Engineering (CPE) and Electrical Engineering (ELE) impose the following expectations on their graduates. Graduates will:

1
have an ability to apply knowledge of mathematics.

2
have an ability to apply knowledge of basic sciences.

3
have an ability to apply knowledge of core ELE/CPE specialties to solve engineering problems.

4
have the ability to create computer programs to solve engineering problems

5
have an ability to develop models and apply them to engineering problems.

6
have effective laboratory skills.

7
have an ability to identify, formulate and solve engineering problems.

8
be able to design a system, component, process or computer program to meet design needs using design principles, techniques and engineering tools.

9
have an ability to work as a contributing member of a multidisciplinary team

10
be able to communicate and express ideas coherently, professionally and effectively.

11
have an understanding of professional and ethical responsibility.

12
have knowledge of contemporary issues and an understanding of the impact of engineering on society.

13
understand the need for and have an ability to engage in lifelong learning.

Computer Engineering Major
BS degree

Computer Engineering encompasses a broad spectrum of challenging activities including research, design, and development of computer systems hardware and software, as well as the electronic or software components that comprise these systems. The Computer Engineering program prepares students to meet the changing high-technology needs in the computer engineering area, and for graduate study in computer engineering, by imparting a strong background in science and mathematics along with engineering skills.

The program consists of a core of basic science and mathematics courses interwoven throughout the four years of study. The student also selects 18 credit hours in general education. Students begin to identify with their field in the first and second year of study. In the junior year, students gain a foundation in computer systems. A senior year composed primarily of elective courses and a capstone design project allows students to concentrate their studies in one or more areas of their choice and hone their skills for the real world. A co-op experience is also available for qualified students in cooperation with regional industries.

Specialization opportunities are offered in microprocessors and microcomputer systems, computer networks, and database systems.

Students may join the Institute of Electrical and Electronics Engineers (IEEE), a professional society with a student branch in the department of Electrical and Computer Engineering. Qualified students can join the Zeta Xi Chapter of Eta Kappa Nu, the Electical and Computer Engineering National Honor Society.

General Education Departmental Requirements

Students majoring in Computer Engineering will meet their departmentally-controlled General Education requirements as follows:

Area E: Satisfied by CIS 381, PHL 215, SOC 164, SOC 323, or TES 350
Area I, Tier 2: Satisfied by ECE 160
Area W, Tier 2: Satisfied by ENL 266
Area O: Satisfied by ECE 457

Requirements

		Semester Credits First	Second
First Year			
ECE 160[1]	Foundations of Computer Engineering I		4
EGR 105, 108	Intro. Engineering through Applied Sci. I, II	2	2
PHY 111*, 112*	Physics for Science & Engineering I, II	4	4
CHM 153*	Principles of Modern Chemistry for Engineers	3	
MTH 113*, 114*	Calculus for Applied Sci. and Engineering I, II	4	4
ENL 101, 102	Critical Writing and Reading I, II	3	3
		16	**17**
Second Year			
ECE 161	Foundations of Computer Engineering II	4	
ECE 201, 202	Circuit Theory I, II	3.5	3.5
ECE 257	Fundamentals of UNIX	1	
ECE 260	Digital logic and Computer Design	3.5	
ECE 263	Embedded System Design		3.5
ECE 264	Object-Oriented Software Development		3
MTH 212	Differential Equations	3	
MTH 213*	Calculus for Applied Sci. and Engineering III		4
ENL 266[2]	Technical Communications	3	
	General Education Elective[3]		3
		18	**17**
Third Year			
ECE 311	Digital Electronics	4	
ECE 367	Operating Systems	3	
ECE 350	Algorithms		3
ECE 368	Digital Design		3
MTH 350	Applied Discrete Mathematics	3	
MTH 331	Probability		3
	Ethics[4]/General Education Electives[3]	3	3
	General Education Electives[3]	3	3
		16	**15**
Fourth Year			
ECE 457[5], 458	Design Project I, II	2	3
ECE 460	Computer System Performance Evaluation		3
CIS 480	Software Engineering	4	
	Restricted CPE Elective[6]	3	
	Technical Electives[7]	6	6
	General Education Elective[3]		3
		15	**15**
	Total credits:		**129**

* Alternative courses should only be taken in exceptional circumstances and with the written permission of an ECE faculty advisor (CHM 151 and CHM 161 in lieu of CHM 153; MTH 111 in lieu of MTH 113; MTH 112 in lieu of MTH 114; MTH 211 in lieu of MTH 213; PHY 113 in lieu of PHY 111; PHY 114 in lieu of PHY 112).

1 This course meets the General Education Area I (Tier 2) requirement: Information and Computer Literacy.
2 This course meets the General Education Area W (Tier 2) requirement: Writing Skills. Must be taken before the student's senior year.
3 See General Education requirements (Areas C, D, and G).
4 General Education Area E requirement: Ethics and Social Responsibility. Must be taken from this list: CIS 381, PHL 215, SOC 164, SOC 323, or TES 350. Must be taken before the student's senior year.
5 This course meets the General Education Area O requirement: Oral Skills.
6 Must be taken from this list: ECE 456, ECE 461, ECE 465, ECE 466, ECE 469, or ECE 486.
7 Must be taken from approved list of Computer Engineering Technical Electives (see next page).

Technical Electives in Computer Engineering

Technical electives are courses above and beyond the required courses that allow computer engineering students to broaden or deepen their engineering knowledge in one or more technical areas. Students are required to take four technical electives. Generally, allowable technical electives are any 400- or 500- level courses in the College of Engineering (CEN, CIS, ECE, MNE, PHY, TES departments) except seminars, independent study, directed study, internship, or required courses within the program. Additional allowable courses are:

Any 300- or 400-level course in Mathematics (MTH) except seminar, independent study, directed study, internship, or required courses within the program.

Any 300-level course in Electrical and Computer Engineering except seminar, directed study, or required courses within the program.

CEN 309	Introduction to Transportation Engineering Systems
CIS 361	Models of Computation
CIS 362	Empirical Methods for Computer Science
PHY 341, 342	Modern Physics and Quantum Mechanics I, II
TES 310	Statistical Quality Control
TES 311	Process Optimization

Choices of technical electives must always be discussed with, and approved by, the student's academic advisor prior to enrollment. Some restrictions are:

1
At most two technical elective courses may be taken from outside the department of Electrical and Computer Engineering.
2
At most two technical elective courses may be taken at the 300-level.
3
The student must have the required prerequisites and/or co-requisites for each course.
4
Enrollment in 500-level courses requires a grade point average of at least 3.000, senior standing, and the written permission of the instructor.

Calculation of the GPA in the Computer Engineering Major

Students must have a 2.000 cumulative grade point average (GPA) for all courses taken at the University in order to graduate. Students must also have a 2.000 cumulative GPA in the major. For purposes of this computation,
1
All courses with an ECE prefix except ECE 298, ECE 400, ECE 401, ECE 495, or ECE 595 and courses with a CIS prefix numbered 200 or above except CIS 298, CIS 411, CIS 491, CIS 492, CIS 495, or CIS 595 count in calculating the GPA for the Computer Engineering major.
2
Courses required for the major but taken outside the major discipline are not counted in the calculation of the major cumulative GPA.
3
As is the case for all University courses, only the most recently earned course grade (whether higher or lower) shall enter in the calculation of the major cumulative GPA.

Electrical Engineering Major
BS degree

The Electrical Engineering program prepares students to meet changing high-technology needs in electrical engineering, and for graduate study, by imparting a strong background in science, mathematics, and engineering.

Electrical Engineering encompasses a broad range of specialties including communications, signal processing, instrumentation, control and automation, power conversion and distribution, RF and microwave devices and systems, and digital and analog techniques. In any of these specialties, electrical engineers work with devices and/or systems to perform various functions such as research and development, systems analysis, management, production, testing, quality control, or sales. They may pursue careers in many areas such as monitoring and control of the environment, space exploration, aerospace and defense, ocean engineering, energy resources, biomedical engineering, information technology, law, or medicine.

The program consists of a core of basic science and mathematical courses interwoven throughout the four years of study. The student also selects 18 credit hours in general education. Students begin to identify with their field in the first and second year of study. In the junior year, students gain a foundation for further study in particular branches of electrical engineering. A senior year composed primarily of elective courses and a capstone design project allows the students to concentrate their studies in one or more areas of their choice, and hone their skills for the real world. A co-op experience is also available for qualified students in cooperation with regional industries.

Students may join the Institute of Electrical and Electronics Engineers (IEEE), a professional society with a student branch in the department of Electrical and Computer Engineering. Qualified students can join the Zeta Xi Chapter of Eta Kappa Nu, the Electrical and Computer Engineering National Honor Society.

Requirements

		Semester Credits First	Second
First Year			
ECE 160[1]	Foundations of Computer Engineering I		4
EGR 105, 108	Intro. Engineering through Applied Sci. I, II	2	2
CHM 153*	Principles of Modern Chemistry for Engineers	3	
ENL 101, 102	Critical Writing and Reading I, II	3	3
MTH 113*,114*	Calculus for Applied Sci. and Engineering I, II	4	4
PHY 111*, 112*	Physics for Science & Engineering I, II	4	4
		16	**17**
Second Year			
ECE 161	Foundations of Computer Engineering II	4	
ECE 201, 202	Circuit Theory I, II	3.5	3.5
ECE 260	Digital Logic and Computer Design	3.5	
ECE 263	Embedded System Design		3.5
MTH 212	Differential Equations	3	
MTH 213*	Calculus for Applied Sci. and Engineering III		4
PHY 213	Applied Modern Physics		3
ENL 266[2]	Technical Communications	3	
	General Education Elective[3]		3
		17	**17**
Third Year			
ECE 311, 312	Digital Electronics/Analog Electronics	4	4
ECE 321	Continuous-Time Linear Systems	3	
ECE 322	Discrete-Time Linear Systems		3
ECE 335, 336	Electromagnetic Theory I, II	3	3
ECE 384	Random Signals and Noise		3
	General Education Elective[3]	3	
	Ethics[4]/General Education Electives[3]	3	3
		16	**16**
Fourth Year			
ECE 457[5], 458	Design Project I, II	2	3
ECE 471	Communication Theory	3	
	Engineering Mathematics[6]	3	
	Technical Electives[7]	6	6
	General Education Electives[3]	3	3
		17	**12**
	Total Credits:		**128**

* Alternative courses should only be taken in exceptional circumstances and with the written permission of an ECE faculty advisor (CHM 151 and CHM 161 in lieu of CHM 153; MTH 111 in lieu of MTH 113; MTH 112 in lieu of MTH 114; MTH 211 in lieu of MTH 213; PHY 113 in lieu of PHY 111; PHY 114 in lieu of PHY 112).

1 This course meets the General Education Area I (Tier 2) requirement: Information and Computer Literacy.
2 This course meets the General Education Area W (Tier 2) requirement: Writing Skills. Must be taken before the student's senior year.
3 See General Education requirements (Areas C, D, and G).
4 General Education Area E requirement: Ethics and Social Responsibility. Must be taken from this list: CIS 381, PHL 215, SOC 164, SOC 323, or TES 350. Must be taken before the student's senior year.
5 This course meets the General Education Area O requirement: Oral Skills.
6 Must be taken from ECE 455, ECE 485, MTH 221, MTH 311, MTH 350, or MTH 421.
7 Must be taken from approved list of Electrical Engineering Technical Electives (see next page).

Technical Electives in Electrical Engineering

Technical electives are courses above and beyond the required courses that allow electrical engineering students to broaden or deepen their engineering knowledge in one or more technical areas. Students are required to complete four technical electives. Generally, allowable technical electives are any 400- or 500- level courses in Electrical and Computer Engineering (ECE), Mathematics (MTH), Mechanical Engineering (MNE), or Computer Science (CIS) except seminars, independent study, directed study, internship, or required courses within the program. Additional allowable courses are:

ECE 367 Operating systems
ECE 350 Algorithms
ECE 368 Digital Design
PHY 341, 342 Modern Physics and Quantum Mechanics I, II
PHY 441 Statistical Thermodynamics
PHY 442 Elements of Solid State Physics
MTH 311, 312 Advanced Calculus I, II
MTH 332 Mathematical Statistics
MTH 353 Applied Linear Algebra
MTH 361, 362 Numerical Analysis I, II

Choices of technical electives must always be discussed with, and approved by, the student's academic advisor prior to enrollment. Some restrictions are:

1
At most two technical elective courses may be taken from outside the department of Electrical and Computer Engineering.
2
At most two technical elective courses may be taken at the 300-level.
3
The student must have the required prerequisites and/or co-requisites for each course.
4
Enrollment in 500-level courses requires a grade point average of at least 3.000, senior standing, and the written permission of the instructor.

Alternative Paths Program Requirements

Depending on the results of placement testing, new freshman students may be placed into one of the following first-year curricula in lieu of the standard curriculum

		First	Second
First Year Courses for Precalculus-Ready Freshmen			
ENL 101,102	Critical Writing and Reading I, II	3	3
CHM 151	Principles of Modern Chemistry I	3	
CHM 161	Intro Applied Chemistry I	1	
MTH 131	Precalculus	3	
MTH 111	Analytical Geometry and Calculus I		4
ECE 160	Foundations of Computer Engineering I		4
	General Education Electives	3	3
		13	**14**

		First	Second
First-Year Courses for Algebra-Ready Freshmen			
ENL 101, 102	Critical Writing and Reading I, II	3	3
CHM 151	Principles of Modern Chemistry I		3
CHM 161	Intro Applied Chemistry I		1
MTH 100*	Basic Algebra	3	
MTH 131	Precalculus		3
CIS 161	Computer Programming BASIC	3	
ECE 160	Foundations of Computer Engineering I		4
	General Education Electives	6	
		15	**14**

* Students receive 3 administrative credits for Math 100. Administrative credits do not not count towards the total credits required for graduation.

General Education Departmental Requirements

Students majoring in Electrical Engineering will meet their departmentally-controlled General Education requirements as follows:

Area E: Satisfied by CIS 381, PHL 215, SOC 164, SOC 323, or TES 350
Area I, Tier 2: Satisfied by ECE 160
Area W, Tier 2: Satisfied by ENL 266
Area O: Satisfied by ECE 457

Calculation of the GPA in the Electrical Engineering Major

Students must have a 2.000 cumulative grade point average (GPA) for all courses taken at the University in order to graduate. Students must also have a 2.000 cumulative GPA in the major. For purposes of this computation,

1
All courses with an ECE prefix except ECE 298, ECE 400, ECE 401, ECE 495, or ECE 595 count in calculating the GPA for the Electrical Engineering major.
2
Courses required for the major but taken outside the major discipline are not counted in the calculation of the major cumulative GPA.

As is the case for all University courses, only the most recently earned course grade (whether higher or lower) shall enter in the calculation of the major cumulative GPA.

Double Major in Electrical Engineering and Computer Engineering

Students interested in pursing a particularly challenging program of study may complete a double major in Computer Engineering and Electrical Engineering, meeting the obligations of both programs

To facilitate such a double major, the department has created a structured advising plan. To accomplish the program in four years, at least one summer must be devoted to academic study. As with individual majors, a co-op experience is available for qualified students in cooperation with regional industries.

		Semester Credits	
		First	**Second**
First Year			
ECE 160[1]	Foundations of Computer Engineering I		4
EGR 105, 108	Intro to Engineering through Applied Sci. I, II	2	2
MTH 113*, 114*	Calculus for Applied Sci. and Engineering I, II	4	4
CHM 153*	Principles of Modern Chemistry for Engineers	3	
PHY 111*, 112*	Physics for Science & Engineering I, II	4	4
ENL 101, 102	Critical Writing and Reading I, II	3	3
		16	**17**
Second Year			
ECE 161	Foundations of Computer Engineering II	4	
ECE 201, 202	Circuit Theory I, II	3.5	3.5
ECE 257	Fundamentals of UNIX	1	
ECE 260	Digital Logic and Computer Design	3.5	
ECE 263	Embedded System Design		3.5
ECE 264	Object-Oriented Software Development		3
MTH 212	Differential Equations	3	
MTH 213*	Calculus for Applied Sci. and Engineering III		4
PHY 213	Applied Modern Physics		3
ENL 266[2]	Technical Communications	3	
		18	**17**
Third Year			
ECE 311, 312	Digital Electronics/Analog Electronics	4	4
ECE 321	Continuous-Time Linear Systems	3	
ECE 367	Operating Systems	3	
ECE 384	Random Signals and Noise		3
ECE 350	Algorithms		3
ECE 368	Digital Design		3
MTH 350	Applied Discrete Mathematics	3	
	General Education Elective[3]/Ethics[4]	3	3
			3
		16	**16**
Fourth Year			
CIS 480	Software Engineering	4	
ECE 322	Discrete-Time Linear Systems		3
ECE 335, 336	Electromagnetic Theory I, II	3	3
ECE 457[5], 458	Design Project I, II	2	3
ECE 460	Computer Systems Performance Evaluation		3
ECE 471	Communications Theory	3	
	Engineering Mathematics[6]	3	
	Restricted CPE Elective[7]	3	
	General Education Elective[3]		3
		18	**15**
Additional Courses (Summers or one additional semester)			
	General Education Electives[3]	**9**	
		Total credits:	**142**

1 This course meets the General Education Area I (Tier 2) requirement: Information and Computer Literacy.
2 This course meets the General Education Area W (Tier 2) requirement: Writing Skills. Must be taken before the student's senior year.
3 See General Education requirements (Areas C, D, and G).
4 General Education Area E requirement: Ethics and Social Responsibility. Must be taken from this list: CIS 381, PHL 215, SOC 164, SOC 323, or TES 350. Must be taken before the student's senior year.
5 This course meets the General Education Area O requirement: Oral Skills.
6 Must be taken from this list: ECE 455, ECE 485, MTH 221, MTH 311, or MTH 421.
7 Must be taken from this list: ECE 456, ECE 461, ECE 465, ECE 466, ECE 469, or ECE 486.

* Alternative courses should only be taken in exceptional circumstances and with the written permission of an ECE faculty advisor (CHM 151 and CHM 161 in lieu of CHM 153; MTH 111 in lieu of MTH 113; MTH 112 in lieu of MTH 114; MTH 211 in lieu of MTH 213; PHY 113 in lieu of PHY 111; PHY 114 in lieu of PHY 112).

Minors in Electrical Engineering and Computer Engineering

Minor in Electrical or Computer Engineering

The Minor in Electrical Engineering and the Minor in Computer Engineering are designed to allow students with quantitative and scientific aptitudes and interests to acquire a basic level of competence in a particular area of electrical engineering or computer engineering. One of these minors can bring significant career benefits to majors in science or other engineering programs.

Admission and Constraints

Any degree candidate who has earned at least 54 credits, with a cumulative grade point average (GPA) of 2.000 and with at least a 2.500 GPA in the major, may request admission to a minor in Electrical Engineering from the chairperson of the department of Electrical and Computer Engineering. A total of at least 19 credits of Electrical and Computer Engineering (ECE) courses must be taken, following a plan of study approved by an advisor in the Department of Electrical and Computer Engineering and signed by the chairperson of the Electrical and Computer Engineering department. At least half of the credits required for the minor must be taken at the University of Massachusetts Dartmouth, and the GPA in the minor must be at least 2.000.

Minor in Electrical Engineering

	Credits
Required of all students ECE 201,202 Circuit Theory I, II **or** ECE 211, 212 Elements of Electical Engineering I, II and ECE 251 Elements of Electical Engineering Laboratory	7

Students also complete one specialization. Typical specializations are:

Electromagnetic Theory ECE 335, 336 Electromagnetic Theory I, II (3, 3) and *two* of the following courses: ECE 431 Antennas and Propagation (3), ECE 433 Advanced Electromagnetic Theory (3), ECE 435 Microwave and RF Engineering (3), and ECE 436 Wireless System Design (3)	12
Communication Theory ECE 321Continuous-Time Linear Systems (3), ECE 384 Random Signals and Noise (3), ECE 471 Communication Theory (3), and *one* of the following two courses: ECE 432 Wireless Communications (3), and ECE 472 Advanced Communications Systems (3)	12
Electronics ECE 260 Digital Logic and Computer Design (3.5), ECE 311 Digital Electronics (4), ECE 312 Analog Electronics (3), and ECE 411 Active Circuits (3)	13.5
Power ECE 260 Digital Logic and Computer Design (3.5). ECE 311 Digital Electronics (4), ECE 335 Electromagnetic Theory I (3), and *one* of the following three courses: ECE 441 Electromechanical Energy Conversion (3), ECE 442 Power Electronics (3), and ECE 443 Power Systems I (3)	13.5
Signal Processing ECE 321 Continuous-Time Linear Systems (3), ECE 322 Discrete-Time Linear Systems (3), ECE 384 Random Signals and Noise (3), and ECE 475 Digital Signal Processing (3)	12
VLSI ECE 260 Digital Logic and Computer Design (3.5), ECE 311 Digital Electronics (4), ECE 413 Introduction to VLSI Design (3), and ECE 414 Introduction to Analog Integrated Circuit Design (3)	13.5

Minor in Computer Engineering

	Credits
Required of all students ECE 160 Foundations of Computer Engineering I, ECE 201 Circuit Theory I, ECE 257 Fundamentals of UNIX, and ECE 260 Digital Logic and Computer Design **or** CIS 180 Object Oriented Programing, ECE 201 Circuit Theory I, and ECE 260 Digital Logic and Computer Design	11 or 12

Students also complete one specialization Typical specializations are.

Computer Architecture ECE 161Foundations of Computer Engineering II (4) **or** CIS 181 Programming Paradigms (4) and ECE 367 Operating Systems (3), ECE 456 Computer Architecture (3), and ECE 468 Advanced Computer Architecture (3)	13
Computer Networks ECE 161 Foundations of Computer Engineering II (4) **or** CIS 181 Programming Paradigms (4), and ECE 367 Operating Systems(3), ECE 469 Computer Networks (3) and *one* of the following three courses: ECE 350 Algorithms (3), ECE 470 Network Application Programming (3), and ECE 489 Network Security (3)	13
Database Systems ECE 161 Foundations of Computer Engineering II (4) **or** CIS 181 Programming Paradigms (4), and ECE 367 Operating Systems (3), ECE 486 Database Systems I (3), and *one* of the following two courses: ECE 350 Algorithms (3), and ECE 466 Database Programming (3)	13
Digital Circuits ECE 263 Embedded System Design (3.5), ECE 367 Operating Systems (3), ECE 368 Digital Design (3), and ECE 461 Microprocessors I (3)	12.5

Gen Ed note: Electrical and Computer Engineering courses satisfy the Natural Science and Technology requirement.

Electrical and Computer Engineering Courses

ECE 160 four credits
Foundations of Computer Engineering I
3 hours lecture, 2 hours laboratory
Prerequisite: Engineering student or permission of instructor
Algorithm development, syntax and semantics of the C programming language stressing computer systems concepts. Concepts of the machine model, procedural programming and program development including coding, debugging and testing of programs are covered. The use of libraries, header files and macros are covered. Engineering examples are used. Variables, operators, control, input/output, arrays, structures, functions, pointers, and files are covered using engineering examples.

ECE 161 four credits
Foundations of Computer Engineering II
3 hours lecture, 2 hours laboratory
Prerequisite: ECE 160
Computer system and program design issues, abstract data types, dynamic memory allocation, procedural and data structures using the C programming language. Concepts of the machine model, procedural programming and program development including coding, debugging, and testing of programs are covered. The following data structures are covered: linked lists, stacks, queues, binary trees and hash tables. Run time complexity and procedural abstractions such as recursive functions are discussed. Features of the C programming language such as multiple header files, libraries and input/output programming with files are covered using engineering examples.

ECE 201 three and one half credits
Circuit Theory I
3 hours lecture, 1.5 hours laboratory
Prerequisite: EGR 108
Corequisites: ENL 266 and MTH 212
The first course covering basic theory of circuit analysis. The goals of this course include developing an ability to solve engineering problems and to design, implement and test circuits to meet design specifications. Topics include network theorems, review of techniques to solve simultaneous equations, nodal and mesh circuit analysis, dependent sources, Thevenin's and Norton's equivalent circuits, solution of first and second order networks to switched DC inputs, natural responses, AC circuit steady-state response analysis, review of complex numbers, phasors, coupled inductors and ideal transformers, rms voltage and current, the maximum power transfer theorem, balanced 3-phase systems, and power and energy computations. Group classroom and project activities require design, simulation, implementation and measurement of practical circuits. Written reports of project results are required. One component of the class is an introduction to the importance of engineering societies to the profession. Joining a society is expected.

ECE 202 three and one half credits
Circuit Theory II
3 hours lecture, 1.5 hours laboratory
Prerequisites: ECE 201, ENL 266, and MTH 212
The second course in basic circuit theory and design. Topics include applications of Laplace transforms to solutions of switched circuits and differential equations with initial conditions, stability, poles/zeros, Fourier transform, frequency response, Bode plots, network analysis, and equivalent circuits. Students are introduced to graphical convolution and Fourier series. Group classroom and project activities require design, implementation and measurement of filters and other circuits to meet design specifications. Students are expected to write an essay on the impact of engineering on society.

ECE 211 three credits
Elements of Electrical Engineering I
3 hours lecture
Prerequisite: MTH 114 (or MTH 112)
Introduces the non-ECE major to some of the basic concepts in Electrical Engineering. The laws of circuit theory and their applications in the analysis of both DC and AC circuits consisting of passive components (resistors, capacitors, and inductors) are introduced. The concepts of power, impedance, reactance, complex power, phasors, and frequency response are discussed. Semiconductor devices (diodes and transistors) are introduced, analyzed, and applied in basic circuits. Use of available computer software to simulate and evaluate circuit performance is required.

ECE 212 three credits
Elements of Electrical Engineering II
3 hours lecture
Prerequisite: ECE 211
Second course of two-part sequence for non-ECE majors, covering more advanced concepts/applications of Electrical Engineering. Amplifiers utilizing bipolar or field-effect transistors are analyzed and designed. The concepts of feedback systems are introduced in the application of operational amplifiers as summers, integrators, differentiators, filters, and comparators. Basic Boolean algebra and elements of digital logic (gates, adders, flip-flops, counters, and registers) are applied in the analysis and design of practical digital circuits. Use of available computer software to simulate and evaluate the analog and digital circuit designs and homework problems is required. In addition, three-phase power, magnetic circuits, and the characteristics, control, and application of AC and DC machines are studied.

ECE 251 one credit
Elements of Electrical Engineering Laboratory
3 hours laboratory
Corequisite: ECE 211
Introduces and develops basic breadboarding techniques and circuit construction; acquaints the non-ECE student with measurements using voltmeters, ammeters, oscilloscopes, power supplies, and signal generators; and demonstrates the practical use of some fundamental electronic devices in simple applications. Students use a computer software package to simulate the behavior of the devices and circuits, which have been constructed and tested in the laboratory exercises.

ECE 257 one credit
Fundamentals of UNIX
1 hour lecture
Prerequisite: ECE 160
Fundamentals of the UNIX operating system. Students apply the skills learned in ECE 160, using the UNIX operating system. Topics covered include X-windows, several basic UNIX commands, compilers and debugging tools, scripting tools, the use of system libraries, and the creation of system libraries.

ECE 260 three and one half credits
Digital Logic and Computer Design
3 hours lecture, 1.5 hours laboratory
Prerequisite: Engineering student or permission of instructor
Fundamental theory and design methods for digital systems. Topics include logic components, Boolean algebra, combinational circuit analysis and design, synchronous and asynchronous sequential circuit analysis and design, state diagrams, state minimization and assignment, basic computer organization and design. This course also teaches the use of software tools for design, minimization, simulation, and schematic capture of digital systems. The digital systems that are designed will be implemented using MSI, LSI, and field programmable gate arrays. A hands-on laboratory is included in which students work in teams.

ECE 263 three and one half credits
Embedded System Design
3 hours lecture, 1.5 hours laboratory
Prerequisite: ECE 260
A study of embedded system design useful to electrical and computer engineers, including assembly language programming, program debugging, and system design. Students learn the fundamentals of microprocessor technology including instruction set architectures, memory hierarchy design, and input/output functions. Practical applications apply this technology toward the design of systems involving data collection, automatic control, and operator interfaces. Emphasis is placed on hands-on program development using a microcontroller.

ECE 264 three credits
Object-Oriented Software Development
3 hours lecture
Prerequisites: ECE 161 or CIS 215; and ECE 257
Basic object-oriented concepts. This course covers language concepts including objects, classes, and polymorphism from the viewpoint of object-oriented design; and implementation including portability, maintainability, networking, and concurrency. There is a term project applying the object-oriented approaches to the entire life-cycle of software development, in which the students work in teams to prototype a software system with design tools and test the system against various design criteria.

ECE 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

ECE 311 four credits
Digital Electronics four credits
3 hours lecture, 3 hours laboratory
Prerequisites: ECE 201; ECE 260; and PHY 112 or PHY 114
Fundamentals of solid-state electronic devices and the application of these devices to the design of digital circuits. Among the topics covered are junction transistors, logic gates, MOS and CMOS logic design, bipolar logic design using emitter-coupled logic (ECL). Focus is on the design of logic circuits through solving design-oriented problems and the design, implementation, and testing of logic circuits by means of computer simulation software. The course has an integrated laboratory and, in addition, contains a component designed to increase awareness of the dynamic nature of the field.

ECE 312 four credits
Analog Electronics
3 hours lecture, 3 hours laboratory
Prerequisites: ECE 202 and ECE 311
Fundamental concepts of analog electronics and the application of these concepts to the design of analog circuits (both discrete and integrated). Among the topics covered are the fundamentals of operational amplifiers, small-signal modeling and linear amplification, single-transistor amplifiers, and multistage amplifiers. Also covered are frequency response, feedback, stability, and oscillators. Focus is on the design of analog circuits through solving design-oriented problems and the design, implementation, and testing of analog circuits by means of computer simulation software. This course has an integrated laboratory.

ECE 321 three credits
Continuous-Time Linear Systems
3 hours lecture
Prerequisite: ECE 202
Introduction to continuous-time signal analysis and linear systems. Topics include classification of signals and systems, basic signal manipulation, system properties, time domain analysis of continuous-time linear time-invariant (LTI) systems, Laplace transform and its use in LTI system analysis, transfer functions and feedback, frequency response and analog filters, Fourier series representation and properties, continuous-time Fourier transform, spectral analysis and AM modulation, and simulation. Students learn to use signal analysis tools.

ECE 322 three credits
Discrete-Time Linear Systems
3 hours lecture
Prerequisite: ECE 321
Introduction to discrete-time signal analysis and linear systems. Topics include time domain analysis of discrete-time linear time-invariant (LTI) systems, solution of difference equations, system function and digital filters, stability and causality, discrete-time Fourier series, discrete-time Fourier transform and discrete Fourier transforms, z-transforms, sampling and the sampling theorem, discrete-time state equations, and communication systems. Students use analysis tools to design systems that meet functional specifications.

ECE 335 three credits
Electromagnetic Theory I
3 hours lecture
Prerequisites: ECE 201; MTH 213 or MTH 211; and PHY 112 or PHY 114
Fundamentals of time-invariant electric and magnetic fields and time-varying electromagnetic fields leading to general Maxwell's equations. Topics include the electromagnetic model, vector calculus, electrostatic fields, steady electric currents, magnetostatic fields, electromagnetic induction, slowly time-varying electromagnetic fields, and Maxwell's equations in integral and differential form; solutions of Maxwell's equations in the presence of boundary conditions are presented. Maxwell's equations in complex domain are introduced and utilized. Circuit theory and its relationship to electromagnetics is presented as an approximate form of Maxwell's equations. Numerical techniques for field computation are introduced. Simulations in a computer classroom include visualization of 2-D and 3-D electric and magnetic fields, and exercises in vector calculus.

ECE 336 three credits
Electromagnetic Theory II
3 hours lecture
Prerequisite: ECE 335
Fundamentals of electromagnetic waves, propagation, and radiation as a continuation of ECE 335. The course reviews general Maxwell's equations in integral and differential form, and electromagnetic boundary conditions. Poynting's theorem and Lorentz potentials are studied. Topics include the propagation of uniform plane electromagnetic waves in free space and in various media (including wave reflection and refraction, and skin effect), transmission-line theory using frequency- and time-domain analysis, analysis of waveguides and electromagnetic resonators, and fundamentals of radiation and antennas. Numerical techniques for radiation and scattering are introduced. Simulations in a computer classroom include the Smith chart, visualization of uniform plane waves and transients on transmission lines, and radiation. Two laboratory experiments on transmission lines and waveguides are performed.

ECE 350 three credits
Algorithms
3 hours lecture
Prerequisites: ECE 161 or CIS 215; MTH 114 or MTH 112; and MTH 181or MTH 350

Computer algorithm design concepts, computational complexity, NP-completeness, and the design and analysis for efficient algorithms. Topics include data structures, sorting, graph, shortest path, depth first search, breadth first search, and network flow networks, computational geometry, dynamic programming, linear programming, parallel and distributed, and other state-of-the-art algorithms. The course includes group projects and presentations requiring students to design experiments to determine algorithms' complexity as well as to design algorithms for problem solving.

ECE 367 three credits
Operating Systems
3 hours lecture
Prerequisites: ECE 161 or CIS 215; ECE 257; and ECE 260
Operating system design and implementation using the specifics of current operating systems. The course covers file, process, memory and Input/Output management; multitasking, synchronization, and deadlocks; scheduling, and inter-process communication. Projects include team system's programming assignments to investigate the kernel interface, files, processes, and inter-process communication for a current operating system.

ECE 368 three credits
Digital Design
2 hours lecture, 3 hours laboratory
Prerequisite: ECE 263
Synthesis of state machines including design, applications and implementation. Register transfer languages and ASM chart design methodologies. PLA, ROM-CENTERED, and FPGA implementations. Specific applications to controllers and interface devices will be discussed. An FPGA based laboratory experience is included.

ECE 384 three credits
Random Signals and Noise
3 hours lecture
Prerequisite: ECE 321
Concepts of probability and statistics as they apply to random signals and their effect on system analysis and design. Topics covered include basic probability, random variables, probability density and distribution functions, joint distributions, conditional distributions, functions of a random variable, mean, variance, covariance, characteristic functions, random processes, correlation functions, power spectral density, linear systems, linear filters, systems that maximize signal-to-noise ratio, and selected applications and designs from communication theory, sonar and radar, and control theory.

ECE 400 three credits
Engineering Internship
Prerequisites: Senior standing; submission of a detailed project proposal to be approved by the ECE Curriculum Committee
An electrical or computer engineering project performed under the joint supervision of an industrial or governmental sponsor and a faculty advisor. ECE 400 may not be substituted for ECE 457/458 - Design Project I/II.

ECE 401 three credits
Undergraduate Research
Prerequisite: Senior standing
Investigations of a fundamental and/or applied nature intended to develop research techniques, initiative, and self-reliance. Also, studies are conducted in areas not included in the formal course offerings. Admission to the course is based on a formal proposal endorsed by an advising professor. On the recommendation of the advising professor, the course may be extended for another three credits.

ECE 403 three credits
Special Topics in Electrical and Computer Engineering
Topics of timely interest in electrical and computer engineering. Course content may change from year to year according to instructor's preferences.

ECE 411 three credits
Active Circuits I
3 hours lecture
Prerequisite: ECE 312
Design course in the manipulation and generation of signals using analog integrated circuits, especially operational amplifiers. Methods are developed to understand and control the impact of practical component limitations like input and output impedance, frequency response, offset voltages, bias currents and cost. Stability considerations and compensation techniques are studied, and students are introduced to noise considerations in circuit design. Students design, build, and test many of the circuits discussed in the course such as precision voltage and current sources, V/I and I/V converters, and active filters. Students work individually on small designs but in teams on larger ones.

ECE 412 three credits
Active Circuits II
3 hours lecture
Prerequisite: ECE 411
Continuation of ECE 411 involving analog integrated circuits, especially operational amplifiers, with nonlinear devices. Students design, build and test many of the circuits discussed in the course such as nonlinear amplifiers, signal generators, sample-and-hold circuits, D/A and A/D's, and phase-locked loops. Students work individually on the small designs but in teams on larger ones.

ECE 413 three credits
Introduction to VLSI Design
3 hours lecture
Prerequisites: ECE 311
Introduction to design of Very Large Scale Integrated Circuits (VLSI), taught at the transistor level. Computer tools are used to create and simulate integrated circuit layouts. Levels of design automation covered include Full Custom layout, Schematic Driven layout, Standard Cells and fully automated synthesis of HDL code. Students are required to complete a project that can be submitted for fabrication.

ECE 414 three credits
Introduction to Analog Integrated Circuit Design
3 hours lecture
Prerequisite: ECE 413
Introduction to the design of CMOS analog integrated circuits (ICs), with occasional references to bipolar IC's to make comparisons. Students are required to complete the design of a reasonably complex IC and make a class presentation of its design methodology and simulation results.

ECE 431 three credits
Antennas and Propagation
3 hours lecture
Prerequisite: ECE 336
Solution of Maxwell's equations for radiation problems. Hertzian dipole as a fundamental radiation element is described. Radiation patterns, directivity, gain, antenna impedance, radiation efficiency, and antenna polarization are defined. The course reviews wire dipole antennas, loop antennas, antennas above ground plane, and corner reflector antennas. Topics include receiving antenna properties, antenna arrays, and microstrip patch and slot antennas. Rectangular horn antennas and parabolic reflector antennas are studied. Also discussed are ground-wave propagation and ionospheric propagation.

ECE 432 three credits
Wireless Communications

3 hours lecture
Prerequisite: Permission of instructor
Introduction to the principles and practice of wireless communications. The course presents the concepts of frequency reuse and cellular structure and covers propagation effects, multipath fading, digital and analog modulation, diversity and equalization, multiple access, and wireless networks. The course also presents modern wireless systems and standards. The focus of the course is to understand wireless communications at a systems level and is designed as a senior elective for ELE and CPE majors. Basic understanding of electromagnetic wave propagation and communication theory is expected. The course includes a project related to new technological advances in wireless systems.

ECE 433 three credits
Advanced Electromagnetic Theory
3 hours lecture
Prerequisite: ECE 336 or permission of instructor
Vector analysis in a generalized orthogonal coordinate system. The course reviews basic electromagnetic-field theorems. Two- and three-dimensional boundary value problems are addressed and solution methods presented. Topics include wave propagation in multi-layer media and wave polarization. Waveguides with cylindrical conducting boundaries, special waveguide types, waveguide devices, cavity resonators, radiation, and scattering are also studied.

ECE 435 three credits
Microwave and RF Engineering
3 hours lecture
Prerequisite: ECE 335
Review of transmission line theory. The concept of impedance transformation is presented. The characteristics of coaxial lines, waveguides, and microstrip lines are studied in detail. Propagation and impedance properties of these lines are derived. Smith charts are used for designing matching and tuning circuits. The use of S-parameters and the analysis of multi-port networks are presented. Passive multi-port devices such as microwave power couplers and dividers are described. The fundamentals of microwave and RF filters and resonators are discussed, and their implementation using microstrip lines and waveguides is also presented.

ECE 436 three credits
Wireless System Design
3 hours lecture
Prerequisite: ECE 335
Design of microwave and RF wireless systems. Transmission line theory and network analysis are reviewed and the fundamentals of antenna theory are presented. Basic antennas such as dipoles, slots, and horns are covered. System noise and its description are discussed. Operational concepts of microwave detectors and mixers are presented. The design and analysis of detector and mixer circuits are covered. Operational concepts of microwave and RF amplifiers, oscillators, and frequency synthesizers are presented. the integration of components in microwave and RF receivers and their performance are covered. Microwave systems such as radar, remote sensors, and radiometers are also described.

ECE 438 three credits
Optical Devices
3 hours lecture
Prerequisite: Senior standing or permission of instructor
Modern optical devices, introduced and incorporated in the design of electro-optic systems. Optical fibers, lenses, prisms, gratings, polarizers, interferometers, filters, beam splitters, light sources including lasers, light modulators, light detectors, and array sensors are incorporated into the design of optical systems intended for communications, illumination, metrology, display and observation. Design experience is achieved through assignments that are progressively larger system design problems generally incorporating earlier designs.

ECE 441 three credits
Electromechanical Energy Conversion
3 hours lecture
Prerequisite: ECE 311
Transformers and rotating machines. Among the AC devices studied are three-phase transformers, induction motors, reluctance motors, stepper motors, and synchronous motors. DC motors and electric vehicle drive circuits are included.

ECE 442 three credits
Power Electronics
3 hours lecture
Prerequisite: ECE 311
Electronic circuit design techniques using power semiconductor devices for industrial and residential applications. Typical applications include switching DC power supplies, power conditioners, DC-to-AC inverters, DC-to-DC converters, motor controllers, AC-to-AC converters, and utility-intertie.

ECE 443 three credits
Power Systems I
3 hours lecture
Prerequisite: ECE 335
First course of a two-semester sequence covering energy sources such as fossil-fuels, nuclear, hydro, photovoltaic, wind, and biomass, loads such as residential and commercial end-users, and the transmission-distribution networks that connect them.

ECE 444 three credits
Power Systems II
3 hours lecture
Prerequisite: ECE 443
Second course of a two-semester sequence continuing with the modeling, analysis, and design of power generating plants, loads, and transmission-distribution networks.

ECE 455 three credits
Computing Methods of Numerical Analysis
3 hours lecture
Prerequisites: ECE 160 or CIS 115, MTH 212; and MTH 213 or MTH 211
Mathematical methods useful to the computer engineer including topics from numerical analysis and linear algebra. Students learn how and when to apply a particular numerical analysis tool or method and can analyze and interpret the results provided by the method. Emphasis is placed on selecting appropriate numerical tools for a variety of basic problems, applying them, and studying their reliability, efficiency, and computer implementation. A large number of problems are solved using the computer.

ECE 456 three credits
Computer Architecture
3 hours lecture
Prerequisites: ECE 161 or CIS 215, and ECE 260; or permission of instructor
An examination of various components that make up a computer system, including CPU, memory, input/output, and buses, as well as how they all work together to form a functioning computer system. The major advances in the computer organization and architecture including von Neumann architecture, interrupts, the family concept, microprocessors, cache memory, virtual memory, virtual I/O, pipelining, RISC, superscalar processors, IA-64 (EPIC), microprogrammed control unit as well as parallel processing are also presented. This course includes team projects.

ECE 457 two credits **O**
Design Project I
1 hour lecture, 3 hours laboratory
Prerequisite: Senior standing in electrical or

computer engineering
The goal of this course is to prepare the student to undertake and successfully complete the capstone design experience embodied in the subsequent course ECE 458 Design Project II. The objectives of this course include providing a firm basis in the methodology of planning and executing an engineering design project, exposing the student to real case studies involving engineering design, forming a design project group and developing group skills in executing design projects, preparing a design project plan, and having the student groups select a design project of appropriate complexity and their faculty advisor in preparation for the subsequent course ECE 458. Included in this course are two major written reports and two major oral presentations as well as minor reports and presentations.

ECE 458 three credits **O**
Design Project II
1 hour lecture; 6 hours laboratory
Prerequisites: ECE 457
Continuation of ECE 457. Goals of this course are for the student to conduct, successfully complete, and professionally present the results of his/her capstone design project under the oversight of his/her faculty advisor. The objectives of this course include executing the design project plan prepared in ECE 457, conducting group activities associated with the execution of the design project, participating in design reviews, preparing the project report, and presenting and demonstrating the results of the project activities to a group of faculty, students, and industry representatives. Included in this course are three major written reports and three major oral presentations as well as minor reports and presentations.

ECE 460 three credits
Computer Systems Performance Evaluation
3 hours lecture
Prerequisites: ECE 263, ECE 367, ECE 350, and MTH 331 (or ECE 384)
Probability and statistics with applications to principles of queuing theory, computer systems simulation, and empirical analysis techniques as applied to computer systems modeling. This course is oriented toward a practical application of theory and concepts to computer systems hardware and software performance.

ECE 461 three credits
Microprocessors I
3 hours lecture
Prerequisites: ECE 263 and ECE 367
Design and construction of a microprocessor based computer system. Students will learn how a computer operates at the chip level and develop an understanding of the interdependence of hardware and software. Students will develop circuitry and software to control CPU interaction with SRAM, ROM and peripheral chips, as well as reset and boot-up control and interrupt handling. At the end of the course, students will have produced a working computer.

ECE 462 three credits
Microprocessors II
3 hours lecture
Prerequisite: ECE 461
Design and construction of multiprocessor microprocessor computer systems. This course is a continuation of ECE 461 in which students will modify the previous design to accommodate multiple processors to achieve parallel computation.

ECE 463 three and one half credits
Software Engineering
3 hours lecture, 1.5 hours laboratory
Prerequisites: ECE 264 and ENL 266
The software development process: user requirements, specifications, design, coding, testing, maintenance, documentation and management. This course is designed to enable participants to acquire the ability to (1) apply software engineering principles and practices to the planning and development of an actual software product, (2) work as a member of a software project team, (3) produce professional software engineering documents, and (4) deliver oral presentations associated with software development.

ECE 465 three credits
Microprogrammed Design
3 hours lecture
Prerequisite: ECE 263
Microprocessor and microcontroller design and operations using state machine and microprogramming techniques. Students will learn how to describe, design and test architectures from assembly language perspectives and learn how to develop microprogrammed implementations of an assembly level instruction set for a variety of platforms.

ECE 466 three credits
Database Programming
2 hours lecture, 3 hours laboratory
Prerequisites: ECE 26;, MTH 181 or MTH 350;, and MTH 331 or ECE 384
Database management system specification, design, implementation, operations and evaluation introduced using a current industrial grade database management system (Oracle, IBM DB2, Microsoft SQL or Informix UDS). SQL language concepts including object-relational operations, object-language relational schema modeling using entity-relationship modeling concepts, data definition language, data manipulation language, data control language, persistent stored modules, triggers and assertions specification and use, applied within both ad-hoc and embedded systems environments are investigated in a studio classroom context. The laboratories include team database application development projects utilizing all major elements of contemporary object-relational database languages aimed at developing least cost solutions to contemporary information management problems.

ECE 467 three credits
Advanced Database Design
2 hours lecture, 3 hours laboratory
Prerequisite: ECE 466
Database management systems and operations. Students learn how to describe and design a database, how to describe and specify embedded and ad-hoc database applications, and how to develop least cost solutions to information management problems integrated through a series of database design exercises implemented within an industry grade database management system. Topics include database management systems architecture and operations, database applications specification, database stored procedure design, database embedded program design, and database ad-hoc specification and design.

ECE 468 three credits
Advanced Computer Architecture
3 hours lecture
Prerequisite: ECE 456
Advanced computer design, emphasizing fundamental limitations and tradeoffs in designing high performance computer systems. Students develop an understanding of the theoretical foundations in both hardware and software by studying parallel computer models; program partitioning, granularity, and latency; processor architectures and interconnects; and memory hierarchy, interleaving and bandwidth. Specific architectures such as shared memory multi-processors, message passing multi-computers, and superscalar, supervector, VLIW, and dataflow designs will be explored.

ECE 469 three credits
Computer Networks
3 hours lecture
Prerequisites: ECE 201 and ECE 367
Introduction to current networking methodologies. Backbone design, layered architecture, protocols, local and wide area networks, internetworking, broadband, electrical interface, and data transmission. Simulation projects are included.

ECE 470 three credits
Network Application Programming
3 hours lecture, 2 hours laboratory
Prerequisite: ECE 469
Methodologies of network application programming, design and implementation. Client-Server model, threads, and synchronization in a distributed computing environment, communication protocols (TCP/UDP and TCP/IP), inter-process communication using sockets, remote procedure calls (RPC), and the transport interface (XTI) are covered. This course includes the design, implementation and testing of both network application projects and an intranet laboratory in which the students work in teams.

ECE 471 three credits
Communication Theory
3 hours lecture
Prerequisite: ECE 384
Probability theory, signals and linear networks, Fourier transforms, random processes and noise are reviewed. Analog communications including amplitude and frequency modulation with and without noise are studied. Digital communications including baseband pulse modulation, quantization, sampling theory, digital pulse shaping, matched filter, Nyquist criterion and error rates due to noise are covered.

ECE 472 three credits
Advanced Communications Systems
3 hours lecture
Prerequisite: ECE 471
Continuation of ECE 471. Signal-space analysis is introduced. Passband digital transmission, direct sequence and frequency-hop spread-spectrum modulation and multiuser radio are studied. Entropy is discussed and channel capacity is derived. Block and convolutional error-control coding is covered.

ECE 475 three credits
Digital Signal Processing
3 hours lecture
Prerequisite: ECE 322
Methods and techniques for digital signal processing, covering the basic principles governing the design and use of digital systems as signal processing devices. Review of discrete-time linear systems, Fourier transforms and z-transforms. Topics include allpass and minimum-phase systems, linear phase systems and group delay, sampling, decimation, interpolation, discrete-time filter design and implementation, discrete Fourier series, discrete Fourier transform, the fast Fourier transform, and basic spectral estimation. Applications to digital processing of real data are included.

ECE 477 three credits
Digital Processing of Speech Signals
3 hours lecture
Prerequisites: ECE 384 and ECE 475; or permission of instructor
Applications of digital signal processing to speech signals. Course goals are to reinforce concepts learned in prerequisite courses, to introduce new tools needed to deal with time-varying signals and to have students apply what they have learned to their own voices. A semester design project is a large component of this course. Topics include a review of digital signal processing and random signal fundamentals, brief introduction to articulatory and acoustic phonetics, time-domain methods for speech processing, short-time Fourier analysis, homomorphic speech processing, linear predictive coding of speech, and applications.

ECE 481 three credits
Control Theory I
3 hours lecture
Prerequisite: ECE 321
Classical control of single-input single-output systems. Both time domain and frequency domain analysis and design techniques are presented. Subjects included are signal flowgraphs, control devices, electrical motors, root-locus, Bodé plots, stability, Routh-Hurwitz criterion, Nyquist stability, phase lead/lag controllers and PID controllers.

ECE 482 three credits
Control Theory II
3 hours lecture
Prerequisite: ECE 481
Continuation of ECE 481. Control Theory II introduces control of discrete systems, modern control theory, and nonlinear control. Concepts of discrete systems, state variables, observability, controllability, phase plane and describing functions method are surveyed.

ECE 485 three credits
Advanced Engineering Mathematics
3 hours lecture
Prerequisites: MTH 213 (or MTH 211) and MTH 212
Selective topics in advanced engineering mathematics. The mathematical areas considered are linear algebra, partial differential equations, complex analysis, and calculus of variations. Representative examples of the topics covered are real and complex matrices, eigenvalues and eigenvectors, method of separating variables for solving partial differential equations, solution of partial differential equations by Fourier series and integrals, integration of complex functions, Taylor and Laurent series, conformal mapping, unconstrained and constrained optimization, and Lagrange multipliers.

ECE 486 three credits
Database Systems I
3 hours lecture
Prerequisite: ECE 367
Introduction to database systems from an architectural and functional perspective. The course provides an overview of database systems architecture, computer representation of information, computer data storage, properties of persistent data, database structuring models (relational, object, object-relational, and entity-relationship), transaction processing models, concurrency control techniques, database transaction recovery, and security. These concepts will then be explored by examining and comparing the architecture and operations of database systems such as conventional, real-time, temporal, fault-tolerant, distributed, heterogeneous, secure and others.

ECE 489 three credits
Network Security
3 hours lecture
Prerequisite: ECE 469 or permission of instructor
Principles and practices of security in computer networks. This course covers the theoretical foundations of securing computer networks including cryptography and models. It steps through the practical process of defending networking resources. It also reveals various case studies, large and small, to familiarize the techniques that attackers use. An Internet Testbed is facilitated for students to experiment attacks and defenses.

ECE 491 three credits
Introduction to Ocean Engineering
2 hours lecture, 3 hours laboratory

Note: Some graduate courses may be open to undergraduates. Please consult your department chairperson. See the *Graduate Catalogue* for graduate general and program requirements.

Lab includes boat trips and LMSET Acousto/Optic Tank Experiments
Prerequisite: Senior standing in College of Engineering
Study of a range of ocean engineering topics to provide a basis for the design of systems, which must function in the ocean environment. Topics include ocean waves, water quality, ocean optics, vehicle dynamics, underwater structures, and ocean sensing systems. The course also includes laboratory experiments aboard the UMass Dartmouth research vessel Lucky Lady and experiments in the acousto/optic tank at the UMass Dartmouth Laboratory for Marine Science and Technology.

ECE 493 three credits
Principles of Underwater Systems
3 hours lecture
Prerequisite: ECE 491
Principles that govern the design and operation of underwater systems, for engineering students. The student develops a broad understanding of underwater systems that will prepare him/her for more advanced studies and/or engineering projects in underwater systems. Topics include generation of sonar signals and sound propagation in the ocean. The course also includes laboratory experiments aboard the UMass Dartmouth research vessel Lucky Lady and experiments in the acousto/optic tank at the UMass Dartmouth Laboratory for Marine Science and Technology.

ECE 495 variable credits
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Requires the submission and approval of a detailed proposal that will become part of the student's file. Conditions and hours to be arranged.

ECE 196, 296, 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Requires the submission and approval of a detailed proposal that will become part of the student's file. Conditions and hours to be arranged.

Graduate Courses in Electrical and Computer Engineering

ECE 501 three credits
Master's Graduate Research
Prerequisite: Formal proposal endorsed by a faculty advisor
Investigations of a fundamental and/or applied nature intended to develop design techniques, research techniques, initiative, and self-reliance. Admission is based on a formal proposal endorsed by an advisor and submitted to the ECE Graduate Program Director.

ECE 511 three credits
Application of Active Circuits
3 hours lecture
Prerequisite: Permission of instructor
Advanced analog design techniques with emphasis on using operational amplifiers. Topics include multi-pole transfer functions and stability, noise calculations, interfacing with digital circuits, and specialized analog applications. Problems are solved using numerical and circuit simulation software packages.

ECE 515 three credits
Modern Optics
3 hours lecture
Prerequisite: Permission of instructor
Fermat's Principle, geometrical optics, diffraction theory, Huygens Principle, coherence, Fourier optics, modulation transfer function, side looking radar, holography and lens aberrations.

ECE 517 three credits
Optical Fiber Communications
3 hours lecture
Prerequisites: Fourier analysis and electromagnetics; or permission of instructor
Optical fibers and devices. Topics include structures and wave-guiding, optical fiber signal degradation, optical sources, power launching and coupling, photodetectors, optical receiver operation, transmission link analysis, measurements, optical fiber fabrication and cabling, and introduction to sensors.

ECE 521 three credits
Random Signals and Systems I
3 hours lecture
Prerequisite: Probability and random variables; or permission of instructor
Random variables and probabilistic description of signals and systems. The course provides the analytical tools for studying random phenomena in engineering systems and provides graduate students with an extensive treatment of probability theory, Bayes theorem, random variables, distribution and density functions, conditional distributions, moments, functions of random variables, characteristic functions, stochastic processes, Gaussian processes, stationary processes, correlation functions, power spectral density, response of systems to random inputs, mean square error estimation, filtering and prediction, and noise analysis. The course prepares students for a wide range of courses in communications, signal processing, acoustics, control, and other areas of engineering in which random signals and systems have an important role.

ECE 522 three credits
Random Signals and Systems II
3 hours lecture
Prerequisite: ECE 521 or permission of instructor
A continuation of ECE 521. The application of random signals in a number of engineering problems including detection theory, estimation theory, spectral estimation techniques, estimation and prediction techniques using Kalman filtering and queuing theory.

ECE 523 three credits
Digital Spectral Analysis
3 hours lecture
Prerequisites: ECE 521, ECE 574; or permission of instructor
Spectral estimation techniques with particular emphasis on performance/resolution tradeoffs. The course enables participants to understand spectral estimation and acquire a working knowledge of the spectral analysis techniques available, with a critical understanding of the advantages and limitations of all spectral estimation techniques studied. The student learns: (1) the limitations of Fourier transform based spectral estimators; (2) the benefits and limitations of high resolution methods; (3) how to choose accurate and appropriate models; (4) the "state-of-the-art" in modern spectral estimation; (5) how the modern spectral estimators perform in practice; (6) when to select each spectral estimation method.

ECE 524 three credits
Solid State Electronics
3 hours lecture
Prerequisite: Permission of instructor
Solid state device behavior. Among the topics covered are semiconductor

fundamentals, p-n junction theory, and both the bipolar and the field effect transistor. Emphasis is placed on those transistor parameters that need to be considered in VLSI and microwave applications.

ECE 525 three credits
Digital Filters
3 hours lecture
Prerequisites: ECE 521, ECE 574; or permission of instructor
Design, simulation, and implementation of digital filters. After a review of classical FIR and IIR design techniques and modern AR, MA, and ARMA techniques, the course immerses the student in problem solving with digitized signals and DSP microprocessors. These problems include noise reduction, echo cancellation, signal detection, etc. Computer simulation is an integral part of the course, and students are expected to have some familiarity with small computer operating systems and assembly language programming concepts.

ECE 527 three credits
Active Remote Sensing of the Environment
3 hours lecture
Prerequisites: ECE 336, ECE 384; or permission of instructor
Principles and applications of active remote sensing techniques. Course focuses on microwave and millimeter wave radar techniques. Topics include radar equation, detection theory, scattering from targets and natural surfaces, and imaging systems. The following sensors are covered: synthetic aperture radar (SAR), radar scatterometers, altimeters, polarimetric radars and interferometric radars. Applications include ocean wave and wind measurements, soil moisture measurements, biomass measurements, measurement of land topography, and precipitation studies. Course also includes laboratory computer exercises for analyzing and processing real sensor data.

ECE 528 three credits
Passive Remote Sensing of the Environment
3 hours lecture
Prerequisites: ECE 336, ECE 384; or permission of instructor
Principles and applications of passive remote sensing techniques. Course addresses the use of sensors such as thematic mappers, optical multispectral scanners, infrared radiometers and multispectral microwave radiometers. The following sensors are covered: Thematic Mapper, SPOT, AVHRR, SSM/I and WINDRAD. Applications include ocean color and productivity measurements, ocean temperature measurements, salinity measurements, ocean wind measurements, marine pollution monitoring, and atmospheric measurements. Course also includes laboratory computer exercises for analyzing and processing real sensor data.

ECE 531 three credits
Radio Frequency Propagation in Wireless Systems
3 hours lecture
Prerequisite: ECE 336 or permission of instructor
Analytical and numerical analysis and modeling of electromagnetic propagation at radio frequencies in modern wireless systems. The course reviews plane wave propagation, reflection, transmission, diffraction, antennas, and radiation. Also reviewed are wireless basics such as the cellular concept and fading. Techniques for analyzing propagation in the presence of buildings and the effects of terrain and trees are presented. Applications include site-specific propagation prediction, wireless system performance analysis and adaptive antenna analysis.

ECE 532 three credits
Radar Engineering
3 hours lecture
Prerequisite: ECE 435, ECE 436, or permission of instructor
Fundamentals of microwave radar engineering and radar system analysis. The course covers the radar equation, radar detection theory, noise analysis, radar cross-section, continuous wave and pulsed systems, moving target indicators, pulse compression, radar transmitters and receivers. Also covered are radar systems such as pulsed Doppler radar, synthetic aperture radar (SAR), inverse synthetic aperture radar (ISAR), polarimetric radar and interferometric radar. Applications include target detection, radar remote sensing, satellite oceanography, and terrain mapping.

ECE 533 three credits
VLSI Design
3 hours lecture
Prerequisite: ECE 311; or permission of instructor
Design of Very Large Scale Integrated Circuits (VLSI), taught at the transistor level. Computer tools are used to create and simulate integrated circuit layouts. Levels of design automation covered include Full Custom layout, Schematic Driven layout, Standard Cells and fully automated synthesis of HDL code. Required readings from the current literature lead to a formal written report on recent developments in VLSI. Students are required to complete and present at least one project. Some designs may be fabricated.

ECE 534 three credits
Microwave Electronics
3 hours lecture
Prerequisite: ECE 435, ECE 436, or permission of instructor
Principles and analysis of microwave electronic devices and circuits. The course covers the modeling and analysis of solid-state microwave devices (such as Schottky diodes, PIN diodes, MESFETs and HEMTs), the analysis of mixer and detector circuits and amplifier and oscillator circuits, and quasi-linear and nonlinear analysis techniques. Topics include mixer conversion loss, noise equivalent temperature, s-parameter modeling, amplifier stability, gain and noise circles.

ECE 535 three credits
Analog Integrated Circuit Design
3 hours lecture
Prerequisite: ECE 413 or ECE 533 or permission of instructor
Introduction to the design of CMOS analog integrated circuits (IC's), with occasional references to bipolar IC's to make comparisons. Required readings from the current literature lead to a formal written report on recent developments in analog IC's. Students are required to complete the design of a complex IC and make a class presentation of its design methodology and simulation results.

ECE 536 three credits
Applied Computational Electromagnetics
3 hours lecture
Prerequisite: ECE 336 or permission of instructor
Numerical techniques for practical applications in electromagnetic scattering, propagation, and radiation. The course reviews fundamentals of electromagnetic field and wave theory and covers all basic classes of computational techniques used in modern applied electromagnetics. Numerical techniques include the method of moments, finite difference method, finite element method, and physical optics. Applications cover static and quasi-static problems, transmission lines, scattering, and antennas.

ECE 537 three credits

Antenna Theory
3 hours lecture
Prerequisite: ECE 336 or permission of instructor
Antenna fundamentals, antenna arrays, and basic types of antennas for wireless communication. Mathematical solution of Maxwell's equations for radiation problems is introduced. Basic antenna parameters are defined and discussed. Electrically small antennas are analyzed. Theory of receiving antennas is presented. Topics in antenna arrays include the array factor, pattern multiplication, multidimensional arrays, and phased arrays. Several types of antennas are studied, including wire and microstrip antennas.

ECE 538 three credits
Advanced Antenna Engineering
3 hours lecture
Prerequisite: ECE 537 or permission of instructor
Advanced antenna engineering concepts, with in-depth studies of analysis and synthesis techniques, broadband and aperture antennas, and antenna measurements. The synthesis of arrays and design of broadband antennas are presented. Topics in aperture antennas include Huygens' equivalence principle, horn antennas, slot antennas, and large reflector antennas. The use of antennas as devices in wireless and radar systems is covered, along with antenna measurements. Integral equations for antenna current distributions are studied.

ECE 539 three credits
Electromagnetics of Signal Integrity
3 hours lecture
Prerequisite: ECE 336 or permission of instructor
Electromagnetic fundamentals of signal integrity in high-speed, high-density interconnects. Theory of multi-conductor transmission lines (MTLs) is presented. Per-unit-length capacitance, inductance, conductance, and resistance matrices of MTLs embedded in a multi-layer substrate are introduced and evaluated numerically using the method of moments. Time-domain response of MTLs terminated in arbitrary networks is studied. Circuit-analysis models for MTLs in the Laplace-transform domain are introduced. The effects of signal delay, distortion, cross-talk, ringing, multiple reflections, and losses are discussed.

ECE 541 three credits
Database Systems I
3 hours lecture
Prerequisites: Graduate standing and at least a C grade in programming
Introduction to database systems from an architectural and functional perspective. The course provides an overview of database systems architecture, computer representation of information, computer data storage, properties of persistent data, database structuring models (relational, network, object, object-relational and entity-relationship), transaction processing models, concurrency control techniques, database and transaction recovery, and security. These concepts will then be explored by examining and comparing the architecture and operations of database systems such as conventional, real-time, temporal, fault tolerant, distributed, heterogeneous, secure and others.

ECE 544 three credits
Fault-Tolerant Computing and Reliability Engineering
3 hours lecture
Prerequisites: MTH 212; MTH 331 or ECE 384; or permission of instructor
Techniques for designing and analyzing computer-based systems. Topics addressed include fault, error, and failure cause-and-effect relationships; fault avoidance techniques; fault tolerance techniques, including hardware, software, information, and time redundancy; fault coverage; time-to-failure models and distributions; reliability modeling and evaluation techniques, including fault trees, cut-sets, reliability block diagrams, binary decision diagrams, and Markov models. In addition, availability modeling, safety modeling, and trade-off analysis are presented. The course will also include a research paper and investigation of current topics.

ECE 552 three credits
Fundamentals of Ocean Engineering
3 hours lecture
Prerequisite: Senior standing in engineering or permission of instructor
Study of selected areas of engineering to provide a basis for intelligent engineering design in the ocean. Topics include ocean forces, basic ship theory, undersea life-support, marine navigation systems, and corrosion.

ECE 553 one credit
Ocean Engineering Laboratory
3 hours laboratory
Corequisite: ECE 552
Measurements of ocean properties and processes. Topics include navigation, underwater sound, underwater light, and oceanographic, biological, and water quality parameters. Experiments are performed from UMass Dartmouth's research vessel and in the laboratory. Each student designs and executes an at-sea experiment.

ECE 557 three credits
Fundamentals of Acoustics
3 hours lecture supplemented by classroom demonstrations
Prerequisite: Graduate standing; or permission of instructor
Fundamentals of acoustics including vibration and wave propagation in solid and fluid media. Topics include: vibration and wave propagation in one-dimensional, two-dimensional, and three-dimensional media including strings, bars, membranes, plates and fluids; mechanical and electrical equivalent circuit models, separation of variables and normal modes; the development of the homogeneous and inhomogeneous linearized wave equation and solutions; propagation of plane waves and spherical waves in gasses and fluids, derivation of speed of sound for arbitrary fluids, complex sound speed and wave numbers; acoustic impedance, acoustic velocity, acoustic displacement and energy relations; reflection, transmission, refraction, and attenuation phenomena in fluids.

ECE 560 three credits
Computer Systems Performance Evaluation
3 hours lecture
Prerequisites: ECE 460; graduate standing
Development of a broad working knowledge of probability, queuing theory, petri-nets, simulation and empirical modeling as applied to computer systems hardware and software performance modeling and assessment. The course is oriented toward a practical application of theory and concepts with an emphasis placed on the use of computer tools to model performance and to perform trade-off analysis.

ECE 561 three credits
Computer Systems
3 hours lecture
Prerequisites: ECE 161 and ECE 260; or permission of instructor
An examination of various components that make up a computer system, including CPU, memory, input/output, and buses, as well as how they all work together to form a functioning computer system. The major advances in the computer organization and architecture including von Neumann

architecture, interrupts, the family concept, microprocessors, cache memory, virtual memory, virtual I/O, pipelining, RISC, superscalar processors, IA-64 (EPIC), micro-programmed control unit as well as parallel processing are also presented. State-of-the-art research projects are assigned to prepare students to perform research in the field of computer organization and architecture.

ECE 562 three credits
Advanced Computer Architecture
3 hours lecture
Prerequisite: ECE 561 or permission of instructor
Advanced computer design, emphasizing fundamental limitations and tradeoffs in designing high performance computer systems. Students develop an understanding of the theoretical foundations in both hardware and software by studying parallel computer models; program partitioning, granularity, and latency; processor architectures and interconnects; and memory hierarchy, interleaving and bandwidth. Specific architectures such as shared memory multi-processors, message passing
multi-computers, and superscalar, supervector, VLIW and dataflow designs will be explored.

ECE 565 three credits
Computer Operating Systems
3 hours lecture
Prerequisites: ECE 161 or CIS 215; ECE 257; and ECE 260
Operating system design and implementation using the specifics of current operating systems. Topics covered include: file, process, memory and Input/Output management; multitasking, synchronization, and deadlocks; scheduling and inter-process communication. Projects include system's programming assignments to investigate the kernel interface, files, processes, and inter-process communication for a current operating system.

ECE 566 three credits
Microprocessors I
3 hours lecture
Prerequisites: Graduate standing in the College of Engineering
Design and construction of a microprocessor based computer system. Students will learn how a computer operates at the chip level and develop an understanding of the interdependence of hardware and software. Students will develop circuitry and software to control CPU interaction with SRAM, ROM and peripheral chips, as well as reset and boot-up control and interrupt handling. At the end of the course, students will have produced a working computer.

ECE 567 three credits
Microprocessors II
3 hours lecture
Prerequisite: ECE 566
Design and construction of multiprocessor microprocessor computer systems. This course is a continuation of ECE566 in which students will modify the previous design to accommodate multiple processors to achieve parallel computation.

ECE 569 three credits
Advanced Computer Networks
3 hours lecture
Prerequisite: ECE 469 or permission of instructor
Advanced topics on the protocols, algorithms, and tools supporting the development and delivery of quality assured services over networks. The course covers capabilities provided by emerging ultra-fast network technologies, routers and routing functions. Emphasis on today's de-facto Internet standards of TCP/IP protocol suite, recent developments and research issues for next generation internetworking driven by multimedia real-time distributed applications requiring quality of service guarantees.

ECE 571 three credits
Digital Communications
3 hours lecture
Prerequisite: ECE 471 or permission of instructor
Fundamentals of digital communications. Topics covered include information theory, vector signal space, detection of digital signals in noise, sampling process, waveform coding techniques, digital modulation and demodulation techniques, error control coding, spread spectrum modulation, and wireless communications.

ECE 574 three credits
Discrete-Time Signal Processing
3 hours lecture
Prerequisites: ECE 384, 475; or permission of instructor
Representation, analysis and design of discrete signals and systems. Topics include a review of the z-transform and the discrete-time Fourier transform, the fast Fourier transform, digital filter structures, digital filter design techniques, quantization issues and effects of finite word-length arithmetic, sampling and oversampling, decimation and interpolation, linear prediction, the Hilbert transform, and the complex cepstrum. Students gain experience in analyzing and designing digital signal processing systems through computer projects.

ECE 575 three credits
Sonar Signal Processing
3 hours lecture
Prerequisites: ECE 521, 597; or permission of instructor
Classical theories in detecting and processing both active and passive signals in noise with special emphasis on the underwater environment and associated techniques in sound navigation ranging (SONAR). Both spatial and temporal processing methods are studied including beamforming, matched filtering, effects of noise and interference, application and utility of frequency agile signals, narrowband and broadband passive techniques, and adaptive algorithms to address the time/space varying interference sources. Applications in underwater detection, classification, localization, and communication are also discussed.

ECE 576 three credits
Computer Communications
3 hours lecture
Prerequisite: ECE 471 or permission of instructor
Mathematical theory for computer network analysis and design; coding for error control; system elements including terminals, modems, multiplexers and concentrators, and communication processors; digital transmission media, teleprocessing networks and computer networks; system modeling and analysis; reliability and security problems in computer communications.

ECE 577 three credits
Artificial Intelligence
3 hours lecture
Prerequisites: Probability and random variables; or permission of instructor
An introduction to artificial intelligence and expert systems. Topics covered include state-space representations and search methods; problem-reduction representation and search methods; Bayes networks; theorem proving using predicate calculus; natural languages; expert system design using Lisp or Prolog; and an introduction to neural networks and pattern recognition.

ECE 580 three credits
Time Series Analysis
3 hours lecture
Prerequisite: ECE 384 or permission of instructor
Fundamentals of time series analysis. Topics

include: moving average and autoregressive models; estimation of the mean and autocorrelation; statistical forecasting; spectral analysis and estimation; bivariate processes; linear system identification; and nonstationary time series. Application to electrical engineering problems is emphasized.

ECE 581 three credits
Mathematics of Systems Analysis
3 hours lecture
Prerequisite: Graduate standing
Elementary exposition of linear algebra and time domain methods and their utility in the analysis and design of linear systems. Linear space, state variables, controllability, observability, assignability, linear state variable feedback design, time variant systems and adjoint model are included.

ECE 582 three credits
Optimal Control Theory
3 hours lecture
Prerequisite: ECE 581
The calculus of variation and classical optimal control techniques based on it. Modern control theory is presented including Pontryagin's principle of maximum and Bellman's dynamic programming. Relation to Hamiltonian mechanics is discussed.

ECE 583 three credits
Nonlinear Systems Theory
3 hours lecture
Prerequisite: ECE 581
Analysis and design techniques for nonlinear systems. Topics covered include singular points, contraction mapping, existence and uniqueness of solutions, comparison principle, Lyapunov stability, stability of perturbed systems, slowly varying systems, input-output stability, circle criterion, Popov criterion, small-gain theorem, describing function method, feedback control design via linearization, exact feedback linearization, and other selected topics from nonlinear control theory.

ECE 584 three credits
Estimation Theory
3 hours lecture
Prerequisites: ECE 521, 581
Basic concepts and principles of estimation theory. Topics include least squares estimation, recursive least squares estimation, best linear unbiased estimator, Bayes estimation, maximum likelihood estimation, maximum a posteriori estimation, conditional mean, Gauss-Markov random process, Kalman filtering, prediction, smoothing, and nonlinear estimation. Estimator bounds and properties are discussed.

ECE 587 three credits
Fuzzy Sets and Applications
3 hours lecture
Prerequisites: Probability and random variables; or permission of instructor
Concepts of fuzzy sets, understanding their impact on mathematics, and development of the principles of design. Crisp sets, their operations, and classical two value logic are reviewed and extended to fuzzy sets and fuzzy logic. Relations, orderings, compatibility maps, and morphisms are extended to their fuzzy counterparts. Fuzzy numbers, fuzzy arithmetic and equations are presented. Approximate reasoning, evidence theory, possibility theory and probability are covered. Measures of uncertainty, vagueness, and information are developed. Application to fuzzy control is presented while applications to other disciplines are studied via individualized student projects.

ECE 591 three credits
Topics in Electrical and Computer Engineering
3 hours lecture
Prerequisite: Permission of instructor
Topics of timely interest in Electrical and Computer Engineering. Course content may change from year to year according to instructor's preferences.

ECE 592 three credits
Principles of Project Engineering
3 hours lecture
Prerequisite: Permission of instructor
An introduction to design, scheduling, managing, implementation, and documentation of engineering and applied science projects. The course emphasizes the methodologies that lead to successful execution of projects and the phases and steps of the design process. The course requires the students to practice writing parts of a professional technical document or journal submission. Students work on real engineering tasks and assignments of contemporary importance; these may be work or school related.

ECE 593 three credits
Quantum Electronics
3 hours lecture
Prerequisites: ECE 336 and PHY 341; or permission of instructor
General principles of laser systems including media, transmission and resonators. Specific laser types including solid state, gaseous and semiconductor. Modulation, noise and detection of optical radiation. Nonlinear applications such as second harmonic generation and parametric interactions.

ECE 595 three credits
Independent Study
Prerequisites: Submission of a formal proposal that includes grading procedure; approval by the instructor, student's advisor, ECE Graduate Program Director, and department chairperson before the course begins.
Allows study into areas not included in the formal course listings.

ECE 596 three credits
Directed Study
Prerequisite: Permission of the instructor, the ECE Graduate Program Director, and the department chairperson.
Allows completion of a numbered course formally in the graduate program listing but not being offered as a scheduled class.

ECE 597 three credits
Underwater Acoustics I
3 hours lecture
Prerequisite: ECE 557 or permission of instructor
Underwater aspects of sound including a review of the wave equation and its solutions. Topics include: production, propagation and reception of sound underwater, radiation impedance, normal modes in rectangular and cylindrical cavities, acoustic waveguides, group speed and phase speed, introduction to transducers and arrays, beam patterns and aperture functions – Fourier transform pairs, beam steering, The wave equation and its application to boundary value problems are reviewed. The Eikonal equation, velocity profiles in the ocean, ray tracing techniques and propagation models of sound in the sea are introduced. Transmission loss, noise, directivity and the passive and active sonar equations are also developed.

ECE 598 three credits
Underwater Acoustics II
3 hours lecture
Prerequisite: ECE 597 or permission of instructor
A continuation of ECE 597. This course covers advanced aspects of underwater sound propagation including ray, normal mode, parabolic and WKB approximations, shallow water treatments, surface and bottom reflection, scattering theory, reverberation, and ambient and self noise studies.

ECE 601 up to 6 credits
Master's Graduate Thesis
Prerequisite: Submission of a formal proposal endorsed by the student's Graduate Committee
Investigations of a fundamental and/or applied nature, intended to develop design techniques, research techniques, initiative, and self-reliance. A written thesis must be completed in accordance with the rules of the Graduate School and the College of Engineering. Admission to the course is based on a formal proposal endorsed by the student's graduate committee and submitted to the ECE Graduate Program Director.

ECE 603 three credits
Pre-Dissertation Research
Research for and preparation of doctoral dissertation proposal. The dissertation proposal must provide a thorough survey of the research activities in the research topic area and it must present original and innovative research ideas and preliminary results as well as a defined research scope and directions. PhD students must have passed this course before registering for doctoral dissertation research credits. Graded P/F.

ECE 609 three credits
Distributed Computing Architecture
3 hours lecture
Prerequisites: ECE 561, 565
Corequisite: ECE 562
An in depth exploration of the architecture and systems of state-of-the-art distributed computers. Students will develop an understanding of the requirements and design issues associated with high performance computing using networks of commodity computers, including the underlying networking technologies and issues and techniques associated with process scheduling and load balancing. Representative systems will be examined.

ECE 610 three credits
Distributed Computing Programming
3 hours lecture
Prerequisites: ECE 561, 565
Corequisite: ECE 562
An in depth exploration of the issues and methodology in programming distributed computers. Students will develop an understanding of the programming languages and supporting programming environments associated with high performance computing on networks of commodity computers. Representative algorithms and applications will be examined.

ECE 611 three credits
Current Topics in Distributed Computing
3 hours lecture
Prerequisites: ECE 561, 565
Corequisite: ECE 562
A survey of issues and methodology in programming distributed computers. Students will develop an understanding of the hardware and software used in high performance computing based upon networks of commodity computers. Representative systems, algorithms, and applications will be examined.

ECE 615 three credits
Ocean Optics
3 hours lecture
Prerequisite: ECE 515 or permission of instructor
Interaction of light within the ocean and at the air-sea interface. Topics studied include hydro-optical characteristics, factors determining the optical properties of ocean water, molecular optics of ocean water, scattering by suspended particles, air-sea interactions, and inverse problems.

ECE 624 three credits
Quantum Phenomena for Electrical Engineers
3 hours lecture
Prerequisite: Permission of instructor
Introduces concepts of quantum mechanics relevant to understanding of modern devices. Topics include the wave-particle nature of electrons, wave packets, scattering by simple barriers, WKB approximation, expectation values and operators, variational principle, perturbation theory, symmetry and degeneracy, and electrons in periodic crystal potentials.

ECE 625 three credits
Carrier Transport in Semiconductors
3 hours lecture
Prerequisite: Permission of instructor
Transport phenomena in semiconductors. Topics include a review of semi-classical carrier transport, the Boltzmann Transport Equation, limitations of drift-diffusion equations, scattering rates/mechanisms, charge and heat flow, Monte Carlo simulation, high-field transport, ballistic transport, and velocity overshoot.

ECE 631 three credits
Database Systems II
3 hours lecture
Prerequisite: ECE 541
An in depth view of database management systems architecture and operations. The focus is on architectural and operational aspects of transactions and transaction processing. Topics include properties of data in a database, database management systems architecture, transaction properties, transaction processing, transaction and database recovery, concurrency control, locking protocols, storage management, and the application of concepts within various database systems. The course includes a design project derived from topics covered

ECE 632 three credits
Advances in Database Systems
3 hours lecture
Prerequisite: ECE 541
An in depth exploration of the theory, architecture, implementation and design of state-of-the-art specialized data base systems. Students will develop an understanding of the requirements and design issues associated with emerging technologies applied to specialized database systems. Database systems to be studied will be selected based on present research interest of course faculty and students.

ECE 640 three credits
Wavelets
3 hours lecture
Prerequisites: ECE 574 and graduate standing, or permission of instructor
Basic theory and applications of wavelets and filter banks. Wavelet theory provides very general techniques that can be applied to many tasks in signal processing, e.g., multi-resolution analysis in computer vision, subband coding in speech and image compression, and wavelet series expansions in applied mathematics. The course is designed to enable participants to understand wavelet theory and to acquire a working knowledge of the techniques available in this signal processing area. In particular, a paramount goal is to enable each participant to develop a critical understanding of the advantages and limitations of wavelet analysis.

ECE 642 three credits
Advanced Topics in Signal Processing
3 hours lecture
Prerequisites: ECE 521, 574
Advanced signal processing topics. Content may vary according to instructor's preferences but typically includes selections from: two-dimensional signal processing, higher-order spectral analysis, chaotic signal processing, array signal processing, multirate signal processing, optimal filtering and

linear prediction, time-frequency and time-scale signal analysis, smart antennas, and inverse problems (signal reconstruction). Applications are discussed in radar, sonar, acoustics, speech, communications, and image processing.

ECE 644 three credits
Adaptive Filtering
3 hours lecture
Prerequisites: ECE 521 and ECE 574
Basic theory of adaptive filter design and implementation including applications. Topics include optimal filters, adaptive linear combiners, performance measures, adaptive FIR filters, adaptive IIR filters, and nonlinear adaptive filters. Applications in adaptive signal processing include adaptive modeling and system identification, adaptive deconvolution and equalization, and adaptive interference canceling.

ECE 646 three credits
Digital Speech Processing
3 hours lecture
Prerequisites: ECE 521, ECE 574, and graduate standing
Signal processing and statistical techniques used in processing speech signals providing an understanding of how these techniques are used in the coding, synthesis and recognition of speech. Topics typically include the human vocal and auditory systems, characteristics of speech signals, lossless tube model of speech production, time and frequency domain representations of speech, time-frequency speech analysis methods, homomorphic speech processing, speech coding, speech synthesis, speech recognition, pitch detection and processing, and acoustic preprocessing for speech recognition.

ECE 655 three credits
Ocean Data Acquisition and Processing Systems
3 hours lecture
Prerequisite: ECE 552 or permission of instructor
Focuses primarily on modern shipboard and underwater systems for measuring, analyzing and processing oceanographic, acoustic and optical ocean data. Topics include probes, sensors, and signal conditioning. Channel transfer functions, synoptic measurements and inverse problems are examined.

ECE 669 three credits
Computer Network Management
3 hours lecture
Prerequisite: ECE 569 or permission of instructor
Advanced topics in computer networks. Topics include: network management systems and architectures; network management protocols and standards; management of information bases. Examples are drawn primarily from the Internet (e.g., SNMP).

ECE 671 three credits
Information Theory
Prerequisite: ECE 521 and 571
Fundamental aspects of information theory. Topics include discrete and differential entropy, discrete source and channel model, information rate, mutual information and channel capacity, coding theorems for sources and channels, the data processing theorem, encoding and decoding of data for transmission over noisy channels, rate distortion theory, maximum entropy distributions, and entropy estimation techniques for unknown sources. Several applications of information theory are included.

ECE 672 three credits
Signal Detection Theory
3 hours lecture
Prerequisites: ECE 521 and 571
Fundamentals of detection theory. Topics include Bayes and Neyman-Pearson tests, composite hypothesis testing, nonparametric test, detection of known signals in Gaussian noise, detection of signals with random parameters in noise, multiple pulse detection of signals, generalized likelihood ratio test, Bayes and maximum likelihood estimators, comparison of communication systems, space-time processing, application to radar and sonar.

ECE 673 three credits
Pattern Recognition
3 hours lecture
Prerequisite: ECE 521
An introduction to the theory and applications of pattern recognition. Topics include descriptions of patterns, problem formulation, linear and nonlinear classification theories, representation of patterns, feature selection, supervised and unsupervised training, nonparametric methods in pattern recognition, cluster and mode-seeking techniques, recursive algorithms using stochastic approximation, sequential pattern recognition, design of computer recognition experiments, linguistic approach to pattern recognition.

ECE 674 three credits
Time-Frequency Signal Processing
3 hours lecture
Prerequisites: ECE 574 and graduate standing; or permission of instructor
Time-varying signal processing methods. The course covers many of the prevalent techniques that have been developed over the years for time-frequency signal analysis and addresses the characteristics and properties of time-frequency representations in Cohen's fixed kernel class, e.g., the spectrogram and the Wigner distribution. The course covers many time-frequency representations and addresses their performance tradeoffs in applications.

ECE 675 three credits
Sonar Systems Engineering
3 hours lecture
Prerequisites: ECE 521 and 597; or permission of instructor
Principles and design of sonar systems. Topics include: complex array and element apertures (weighting) functions, and beam shaping; linear, planar, and volumetric arrays; directivity and beam-forming; operating and installation of sonar systems; improving signal-to-noise ratios; wave vector spectrum filtering.

ECE 676 three credits
Advanced Topics in Pattern Recognition
Prerequisites: ECE 673, admission to PhD
Advanced pattern recognition topics. Topics include decision theoretic pattern recognition with contextual information, sequential pattern recognition, error bounds, structural pattern recognition, syntactic and grammatical pattern recognition, error correction parsing, statistical and syntactic mixed models, neural networks, and statistical pattern recognition. Several pattern recognition applications are included.

ECE 677 three credits
Neural Networks
Prerequisites: ECE 521
Theory of neural networks. Topics include learning models, single and multilayer perceptrons, LMS algorithm, back propagation algorithms, radial basis function networks, Hopfield networks and Boltzman machine, self-organizing systems including Hebbian learning, Kohonen feature map algorithm, temporal processing neural networks, biological neural networks, and VLSI implementation.

ECE 678 three credits
Digital Image Processing
3 hours lecture
Prerequisites: ECE 521 and 574

Fundamentals of digital image processing. Topics include human vision models, 2-D sampling and quantization, image transforms, image enhancements, color image processing, image restoration, image and video compression, image segmentation by thresholding and region analysis, texture analysis, boundary descriptions, morphological methods, image processing system architecture.

ECE 679 three credits
Geophysical, Radar, and Speech Signal Processing
3 hours lecture
Prerequisites: ECE 521 and 574
Common mathematical frameworks in the processing of geophysical, radar, and speech signals are introduced, followed by a study of individual source mechanisms and transmission media. Specific digital filtering, deconvolution, spectral analysis and interference or clutter rejection techniques are discussed. Case studies for effective processing of seismic, radar, and speech signals are also included.

ECE 680 three credits
Computer and Robot Vision
3 hours lecture
Prerequisites: ECE 678 or permission of instructor
Conditioning and labeling, the facet model, texture models, image segmentation and arc extraction, 3-D shape representation and shape recovery, surface reflection mechanism, shape from shading, range image analysis, stereo vision, 2-D and 3-D motion analysis, non-rigid body motion analysis, relational matching, 3-D object recognition, fundamentals of robot vision, architecture of computer vision systems.

ECE 697 three credits
Nonlinear Acoustical Theory
3 hours lecture
Prerequisite: ECE 597
Nonlinear acoustic fields and parametric sources. Topics include nonlinear acoustics of fluids, turbulence, underwater explosions as sources of sound, parametric acoustic arrays, finite-amplitude effects, acoustic cavitation, and streaming.

ECE 699 three credits
Acoustic Transduction and Electroacoustic Transducers
3 hours lecture
Prerequisite: ECE 557 and 597
An advanced course covering fundamental principles, design, and operation of transducers for the reception and generation of underwater sound using energy analysis methods. Topics include: theory of simple radiators and receivers, electromechanical circuit analogies, impedance functions and equivalent circuits; piezoelectricity; reciprocity; acoustic properties of transducer materials; acoustic motion sensors; pressure gradient sensor designs, and diffractions constants.

ECE 700 one credit
Graduate Seminar
Prerequisite: Graduate standing
Seminar discussions and presentations based on research or detailed literature surveys.

ECE 701 up to nine credits
Doctoral Dissertation Research
Prerequisites: Successful completion of PhD comprehensive examination and approval of doctoral dissertation proposal by the student's graduate committee
Investigations of a fundamental and/or applied nature representing an original contribution to the scholarly research literature of the field. PhD dissertations are often published in refereed journals or presented at major conferences. A written dissertation must be completed in accordance with the rules of the Graduate School and the College of Engineering. Admission to the course is based on successful completion of the PhD comprehensive examination and submission of a formal proposal endorsed by the student's graduate committee and submitted to the ECE Graduate Program Director.

Mechanical Engineering

Mechanical engineers are involved in a spectrum of technical activities from the design and manufacture of various products to fundamental research.

Mechanical engineers are concerned with the production, transmission, and use of power. They design and develop systems which produce power, such as steam and gas turbines, internal combustion engines, nuclear reactors, jet engines, and rocket motors. They also design, develop, and manufacture devices which consume power in order to accomplish some useful result, such as refrigeration and air conditioning equipment, machine tools, rolling mills, and elevators, to name a few.

The environmental impact of these systems forms an integral part of their analysis and design. Mechanical engineers must cope with stringent standards of air and water quality, noise abatement, and thermal pollution.

Graduates find employment in a number of areas, including private industry, government, consulting firms and education. They may be involved in one or more of the following: research, design, development, manufacturing, administration, management, sales or production supervision. Others continue studies in graduate school.

The Mechanical Engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

A student chapter of the American Society of Mechanical Engineers permits the student to initiate professional contacts through a program of technical and social events which introduces the student to practicing engineers from industry and students from other engineering schools.

Mission Statement

The Mechanical Engineering Department at UMass Dartmouth offers two degrees, a Bachelor of Science in Mechanical Engineering and a Master of Science in Mechanical Engineering. The program provides service to meet the needs of students, industry, government, and society. The program offers excellence, access, and value through a strong commitment to teaching, scholarship, outreach, and professionalism.

Program Educational Objectives

- To educate students in the principles that underlie technological applications related to mechanical design, manufacturing, and energy systems.
- To provide a flexible curriculum having several specialty tracks to meet the diverse needs of an ever diverse student body.
- To contribute to the economic development of Southeastern Massachusetts by providing a resource of practice-oriented graduate education for local industry and conducting research.

Program Outcomes

UMass Dartmouth Mechanical Engineering graduates will have:

- an ability to apply knowledge of mathematics, science, and engineering;
- an ability to design and conduct experiments, as well as to analyze and interpret data;
- an ability to design a system, component, or process to meet desired needs including experience in designing and building a project;
- an ability to function on multi-disciplinary teams including an ability to work collaboratively and a broad interdisciplinary knowledge;
- an ability to identify, formulate, and solve engineering problems;
- an understanding of professional and ethical responsibility;
- an ability to communicate effectively including with written, oral, and electronic communication;
- the broad education necessary to understand the impact of engineering solutions in a global/societal context including understanding cultural, political, and economic issues;
- a recognition of the need and an ability to engage in life-long learning including being an independent learner and working in industry and/or furthering their education in graduate schools, not only in engineering but also in business, law, or medicine, depending on their future interests;
- a knowledge of contemporary issues;
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice including computers and instrumentation.

Faculty and Fields of Interest

Farhad Azadivar (dean of the college of engineering) modeling and optimization of manufacturing systems, computer simulation, management of technological innovation

Sankha Bhowmick heat and mass transfer, bioengineering, MEMS

Diane DiMassa acoustics/hydroacoustics, flow measurement technology, autonomous vehicles, marine engineering design

Ronald DiPippo thermodynamics, power plant design, geothermal energy, energy analysis

Sherif D. El Wakil computer-aided manufacturing, design for manufacturing, materials science

Alex J. Fowler fluid flow in porous media, heat transfer, thermodynamics, bioengineering

Peter D. Friedman experimental fluid mechanics and heat transfer, thermodynamics, nuclear power plant operation

John W. Hansberry solid mechanics, control theory, machine design, vibration, safety engineering

Ibrahim Kattan manufacturing engineering systems, production planning and control, engineering optimization

Raymond N. Laoulache thermodynamics, multiphase flow, control systems, fluid mechanics, laser doppler anemometry, parallel computing

Tesfay Meressi (chairperson) robotics, control theory, machine design

John M. Rice solid mechanics, computer-aided engineering, finite element analysis, composite materials, vibration

T. K. Roy machine design, solid mechanics, shell dynamics, robotics

K. Srinagesh manufacturing processes, physical metallurgy, foundry engineering

Mechanical Engineering Major

BS degree

Throughout the program, the use of computer work stations is emphasized for the solution of complex problems and for the design and manufacture of components and systems. Hands-on design experiences occur throughout the curriculum, culminating in a senior project solving a real-life engineering program with realistic constraints of time as well as economic, aesthetic, safety, social and environmental implications. The students defend their work in an oral presentation before their class, faculty, guests and an invited panel of judges from local industries.

The first two years of the program include basic courses in the areas of mathematics, chemistry and physics, together with introductory courses in applied science such as mechanics, materials and electrical science. Specialization occurs during the last two years with courses available in the areas of thermodynamics, fluid mechanics, manufacturing processes and systems, control systems, materials behavior, energy, and mechanical design.

Areas of Concentration

Design:
MNE 441, 452, 462, 463, 480, 482, 485

Energy:
MNE 422, 423, 424, 425, 431, 432, 460, 492

Manufacturing:
MNE 472, 473, 476, 481, 482

Students should confer with advisors before selecting technical electives to assure that they meet requirements in engineering science and engineering design. Students who wish to select technical electives from other departments must receive prior approval from the mechanical engineering department.

A proposal for experiential learning must be first sponsored by a faculty member and then approved by the full department. A proposal that meets minimum standards shall normally be approved for three free elective credits. An extraordinarily meritorious proposal may be approved for three technical elective credits only if it involves significant creative technical design with a tangible product.

Requirements

		Semester Credits First	Second
First Year			
EGR 107, 108	Intro. Engineering through Applied Sci. I, II	3	2
PHY 111 (or 113)	Physics for Science & Engineering I	4	
PHY 112 (or 114)	Physics for Science & Engineering II		4
MTH 113 (or 111)	Calculus for Applied Sci. and Engineering I	4	
MTH 114 (or 112)	Calculus for Applied Sci. and Engineering II		4
CHM 153	Modern/Applied Chem. for Sci./Engrg. I **OR**	3	
CHM 151, 161	Princ. Modern Chem. I / Applied Chem. I (4)		
CHM 152, 162	Princ. Modern Chem. II / Applied Chem.II		4
ENL 101, 102	Critical Writing and Reading I, II	3	3
		17	**17**
Second Year			
MNE 231	Materials Science	4	
MTH 213 (or 211)	Calculus for Applied Sci. & Engineering III	4	
MNE 102	Programming and Computer Usage	3	
EGR 241, 242	Engineering Mechanics I, II	3	3
	General Education Elective	3	
MNE 212	Math Approaches to Engineering Systems		3
MNE 201	Mechanical Engineering Laboratory I		1
MNE 220	Engineering Thermodynamics I		3
MNE 252	Mechanics of Materials		3
MNE 292	Intro. to Mechanical Engineering Design		1
		17	**14**
Third Year			
EGR 301	Applied Engineering Mathematics	3	
MNE 321	Engineering Thermodynamics II	3	
MNE 345	Design for Manufacturing	3	
MNE 381	Design of Machine Elements	3	
ECE 251	Electrical Measurement Laboratory I	1	
ECE 211, 212	Elements of Electrical Engineering I, II	3	3
MNE 305, 306	Mechanical Eng Lab II, III (biweekly)	0.5	0.5
MNE 332	Fluid Mechanics I		3
MNE 355	Manufacturing Processes Laboratory		1
ENL 266	Technical Communications		3
	General Education Elective		3
MNE	MNE Technical Elective**		3
		16.5	**16.5**
Fourth Year			
MNE 466	Control Theory	3	
MNE 491	Advanced Machine Design	4	
MNE 411	Heat Transfer	3	
MNE	Technical Electives**	3	3
	General Education Electives		9
MNE 497, 498	Design Project I, II	2	2
		15	**14**
	Total credits:		**127**

** Usually taken from approved list (shown on next page).

General Education Departmental Requirements

Students majoring in Mechanical Engineering will meet their departmentally-controlled General Education requirements as follows:

Area E: Satisfied by the sequence MNE 292, 381, 491, and 497/498
Area I, Tier 2: Satisfied by the sequence MNE 292, 305, and 306
Area W, Tier 2: Satisfied by ENL 266
Area O: Satisfied by the sequence MNE 292 and MNE 497/498

Technical Electives

MNE 422	Energy Conversion
MNE 423	Refrigeration & Air Conditioning
MNE 424	Geothermal Energy
MNE 425	Power Plant Design and Engineering
MNE 431	Fluid Mechanics II
MNE 432	Aircraft and Rocket Propulsion Systems
MNE 441	Mechanical Vibrations
MNE 442	Intro. to Numerical Methods
MNE 452	Mechanics of Materials II
MNE 460	Combustion Systems
MNE 462	Experimental Stress Analysis
MNE 463	Kinematic and Dynamic Analysis of Machines
MNE 471	Physical Metallurgy
MNE 472	Metal Forming Operations
MNE 473	Powder Metallurgy
MNE 475	Principles of Foundry Engineering
MNE 476	Manufacturing Quality Control
MNE 480	Computer-Aided Engineering
MNE 481	Computer-Aided Manufacturing
MNE 482	Robotics
MNE 485	Introduction to the Finite Element Method
MNE 490	Special Topics in Mechanical Engineering
MNE 492	Laser Doppler Anemometry in Fluid Flow

Requirements

The Option in Manufacturing Engineering utilizes a core of courses already in the Mechanical Engineering major—MNE 231, MNE 345, and MNE 355—and a special selection of elective courses.

Students in the option in Manufacturing Engineering complete the requirements for Mechanical Engineering, at the same time making the following specific course selections:

- They must select ECO 231 and 232 within the General Education electives.
- They must select three courses—the MNE Technical Electives—from the following list: MNE 471, MNE 472, MNE 473, MNE 475, MNE 476, MNE 481, and MNE 482.

Alternative Paths Program Requirements

Depending on the results of placement testing, new freshman students may be placed into one of the following first-year curricula in lieu of the standard curriculum.

		Semester Credits	
		First	**Second**
First Year Courses for Precalculus-Ready Freshmen			
ENL 101,102	Critical Writing and Reading I, II	3	3
CHM 153	Principles of Modern Chemistry for Engineers I		3
MTH 131	Precalculus	3	
MTH 113	Calculus for Applied Sci. and Engineering I		4
PHY 182	Introduction to the Weather	3	
PHY 111	Physics for Science and Engineering I		4
EGR 107	Intro to Engineering Through Applied Science I		3
	General Education Electives	6	
		15	**17**

		First	**Second**
First-Year Courses for Algebra-Ready Freshmen			
ENL 101, 102	Critical Writing and Reading I, II	3	3
CHM 151	Principles of Modern Chemistry I		3
CHM 161	Intro Applied Chemistry Engineers I		1
MTH 100	Basic Algebra	3*	
MTH 131	Precalculus		3
PHY 182	Introduction to the Weather	3	
EGR 131	Introduction to Design		1
	General Education Electives	6	
		15	**11**

* Students receive 3 administrative credits for Math 100. Administrative credits do not not count towards the total credits required for graduation.

Gen Ed note: Mechanical Engineering courses satisfy the Natural Science and Technology requirement

Mechanical Engineering Courses

MNE 102 three credits
Programming and Computer Usage
3 hours lecture
Prerequisite: MTH 111 or MTH 113
Introduction to computer hardware and software. Computer mathematics; curve fitting; charting; spreadsheets. Data base management. Graphical representation; Applications in mechanical engineering.

MNE 201 one credit
Mechanical Engineering Laboratory I
3 hours laboratory
Corequisites: MNE 220, 252
Experiments to supplement Mechanics of Materials I and Engineering Thermodynamics I. Probability and statistical analysis are applied to experimental results. Topics such as experimental uncertainty, linear regression, normal distributions, confidence intervals, calorimetry, specific heats, engine performance, strain gauges, tensile and torsion testing are typically covered.

MNE 212 three credits
Mathematical Approaches to Engineering Systems
Prerequisite: MTH 114 or MTH 112
Overview and working knowledge of linear algebra and ordinary differential equations applied to engineering problems. Topics include zero-order equations, introduction to ordinary differential equations (ODE's), first-order ODEs, second-order ODEs, second-order boundary value ODEs, and finite difference method for the solution of ODEs.

MNE 220 three credits
Engineering Thermodynamics I
3 hours lecture
Pre- or corequisites: CHM 152, MTH 211 or MTH 213
The fundamental concepts and basic principles of classical thermodynamics. The Zeroth, First and Second laws of thermodynamics are formulated with recourse to empirical observations and then expressed in precise mathematical language. These laws are applied to a wide range of engineering problems. The properties of pure substances are described using equations of state and surfaces of state. Reversible processes in gases are analyzed by means of the First and Second laws. A representative sampling of engineering applications is discussed and analyzed.

MNE 231 four credits
Material Science
3 hours lecture, 1 hour laboratory
Prerequisites: CHM 151 or CHM 153 and CHM 152
The relation between the atomic or micro structure of engineering materials and their properties. Structures of metals, ceramics, polymers and composites are introduced. Experiments on equilibrium diagrams, metallographic structures, property changes of metals are included.

MNE 252 three credits
Mechanics of Materials I
3 hours lecture
Prerequisite: EGR 241
Material behavior and the concepts of equilibrium and compatibility of deformation are combined and initially applied to one-dimensional problems. Torsion of bars is discussed with application to problems of shaft design. Stress in beams of simple and composite shapes is considered as well as shear in beams and combined twisting and bending. Deflections of beams, shafts and structures are discussed using several calculation procedures. Stress and strain are considered in three dimensions with attention to principal directions. Buckling is considered and some attention is paid to plastic action in the various course topics.

MNE 292 one credit **O, E**
Introduction to Mechanical Design
1 hour lecture, 2 hours laboratory
Corequisites: EGR 242, MNE 252
Mechanical design with emphasis on microcomputers as an aid to analysis and optimization. The concept of probabilistic design and the Monte-Carlo techniques are introduced. Attention is primarily paid to the solid mechanical aspects of the subject. Stress, flexibility and minimum weight considerations are addressed through introduction to the finite element method of analysis. Proper form for technical reports and calculations is discussed. Final oral presentation in class required.

MNE 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

MNE 305 one-half credit
Mechanical Engineering Laboratory II
3 hours biweekly
Corequisite MNE 321
Extensive investigations into various commonly-encountered devices in areas of interest to the mechanical engineer. These include engines, turbines, water cooling towers, conduction, convection, radiation and refrigeration

MNE 306 one-half credit
Mechanical Engineering Laboratory III
3 hours laboratory biweekly
Corequisite: MNE 332
Several experiments demonstrating the concepts in the course MNE 332 Fluid Mechanics I. These include: jet impact, Venturi meter, flow under a sluice gate, friction losses in tubes, introduction to data acquisition, and calibration of valves using computer control.

MNE 321 three credits
Engineering Thermodynamics II
3 hours lecture
Prerequisite: MNE 220
Mechanical engineering applications of ideal and real compressors, gas turbine power systems; various air-standard cycles including Brayton, Ericsson, Stirling, Otto, Diesel and Wankel cycles, and several vapor cycles including Carnot, Rankine, modified Rankine, and binary cycles. An introduction is given to vapor-compression refrigeration and heat pumps. Thermochemistry and combustion are discussed with emphasis on application of the First and Second laws to chemical reactions. Chemical equilibria in homogenous gas systems are studied.

MNE 332 three credits
Fluid Mechanics I
3 hours lecture
Prerequisites: MNE 220, MTH 211 or MTH 213
Understanding the basic conservation equations in integral and differential form. The applications are concerned primarily with steady flows of inviscid, incompressible fluids. A brief discussion of similitude and modeling precedes the introduction to viscous flows. Flows in pipe systems with friction influences and including turbines and pumps are studied using the extended Bernoulli equations. The elements of incompressible potential flow are studied using real and complex potential functions.

MNE 345 three credits
Design for Manufacturing
3 hours lecture
Prerequisites: MNE 231
Discussion and comparison of manufacturing processes for economy of production;

and modifications to proposed designs to suit existing equipment. Material selection to suit production and service requirements is covered along with economics of automation and inventory control.

MNE 355 one credit
Manufacturing Processes Laboratory
3 hours laboratory
Prerequisite: MNE 345
Machining operations using conventional and modern machine tools are covered. Basic principles of the statistic and probability theory as applied to quality control of machined parts are discussed and emphasized.

MNE 381 three credits **E**
Design of Machine Elements
3 hours lecture
Prerequisites: MNE 252, EGR 242
Comprehensive survey of the analytical design methods that are valuable to mechanical engineers. Some of the areas covered are: stress analysis, fatigue, stress concentration, design of curved beams, selection of standardized elements, and lubrication. The objective of the course is to enable the student to handle design problems with confidence and assurance.

MNE 400 variable credits
Engineering Internship
Prerequisite: Senior standing
Experiential learning in conjunction with an industrial or governmental agency project under the joint supervision of an outside sponsor and a faculty advisor. To be eligible, a student should have completed the junior-year courses. A detailed project proposal must be prepared by the student for departmental approval prior to the start of the project. Typically, three credits will be assigned. Based upon the determination of the advisor and sponsor, the learning component shall be at least 100 hours out of the total work hours. Up to six credits may be assigned for exceptional projects that extend over two semesters. MNE 400 may be used to satisfy one 3-credit technical elective course.

MNE 411 three credits
Heat Transfer
3 hours lecture
Prerequisites: MNE 220, EGR 301
Principles of heat conduction, forced and free convection and thermal radiation, and their application to various engineering problems. Mass transfer and its analogy to heat transfer phenomena are sketched. Special problems, such as boiling and condensation, heat transfer in high speed flow, and fire propagation are introduced. Mathematical analysis motivated by physical reasoning is emphasized.

MNE 422 three credits
Energy Conversion
3 hours lecture
Prerequisites: MNE 321, 332, ECE 212, consent of instructor
An introduction to various energy resources, followed by a description of the use of chemical potential energy, nuclear energy and solar energy, the analysis and design criteria for various energy conversion devices, such as generators, transformers, motors, power distribution systems, solar cells, and so on. Understanding of working principles and essential design conditions is emphasized.

MNE 423 three credits
Refrigeration and Air Conditioning
3 hours lecture
Prerequisites: MNE 321, consent of instructor
Principles of refrigeration are presented with applications to vapor-compression, steam-jet and absorption systems, together with heat pumps. Psychrometrics and the physiological factors involved in air-conditioning are discussed along with the analysis of various processes. In particular the use and analysis of water cooling towers is emphasized.

MNE 424 three credits
Geothermal Energy
3 hours lecture
Prerequisites: MNE 321, 332, consent of instructor
A brief review of relevant topics from thermodynamics, fluid mechanics and heat transfer. Elements of geology pertinent to geothermal energy are covered. The various types of geothermal resource are discussed. Technical systems of geothermal utilization are covered. Major emphasis is placed on the energy conversion systems which produce electrical power from geothermal resources. Dry steam, single and dual flash, binary, total flow, and hybrid systems are analyzed in detail. The environmental impact of geothermal energy usage and the economic factors associated with it are also discussed.

MNE 425 three credits
Power Plant Design and Engineering
3 hours lecture
Prerequisites: MNE 321, consent of instructor
Theory as a basis for plant design and equipment selection. Practical design calculations including heat balance are carried out. Fossil- and nuclear-fueled plants as well as gas turbine and hydroelectric plants are studied. The economics of alternatives is discussed.

MNE 431 three credits
Fluid Mechanics II
3 hours lecture
Prerequisites: MNE 332, consent of instructor
Basic equations of fluid mechanics, applied to quasi one-dimensional, compressible flows, including: isentropic flows with area changes, Fanno and Rayleigh flows, and normal shock waves. Two-dimensional flow fields are studied using Prandtl-Meyer expansion and oblique shock waves. The basic concepts are applied to selected topics such as: aircraft and rocket propulsion, combustion chambers in jets and rockets, wind tunnels and shock tubes, supersonic diffusers, and flow about supersonic airfoils.

MNE 432 three credits
Aircraft and Rocket Propulsion Systems
3 hours lecture
Prerequisites: MNE 321, 431, consent of instructor
The mechanics and thermodynamics of airborne propulsion systems. Thrust equations and efficiencies are derived from first principles and applied to a variety of systems. Airbreathing engines that are discussed include ramjets, turbojets, turbofans, and turboprops. The aero-thermodynamics of inlets and nozzles is presented. The course concludes with an introduction to rocket propulsion, including the identification and classification of types of rocket systems, fundamental definitions and derivations, and rocket dynamics.

MNE 441 three credits
Mechanical Vibrations
3 hours lecture
Prerequisites: EGR 242, 301, consent of instructor
Discussion of generalized coordinates and the Lagrangian method of determining a system's equations of motion. Normal modes and normal coordinates are introduced and the method of matrix iteration is used to find natural frequencies and modes. Free vibration of continuous systems is considered and techniques for finding natural frequencies are developed. Forced and transient responses of one degree of freedom systems are treated extensively, and forced response of

multi-degree of freedom systems is discussed. Electrical analogies, use of the analog computer, and modeling of actual physical systems are discussed.

MNE 442 three credits
Introduction to Numerical Methods
3 hours lecture
Prerequisites: MTH 212
Numerical methods most useful to the engineer using structured programming. Topics discussed include numerical integration, differentiation, large system of linear and non-linear the use of spreadsheets for engineering calculations as well as solutions of nonlinear algebraic equations, system of ordinary differential equations. Also covered are criteria for stability and convergence and introduction to numerical techniques for partial differential equations.

MNE 452 three credits
Mechanics of Materials II
3 hours lecture
Prerequisites: MNE 252, EGR 301, consent of instructor
After reviewing the development of the flexure formula, the stress equation is derived for unsymmetrical bending. Curved beams loaded in the plane of curvature are analyzed as are beams with combined axial and lateral loadings. The general equation for beams on elastic foundations and its applications are studied. Stresses and deflections due to dynamic loads are examined. The basic equations of elasticity are developed and two-dimensional problems analyzed using Airy's stress function. Solutions are compared to strength of materials results. Energy methods are discussed. The Lagrange plate equation is derived and plates fabricated from modern composite materials are discussed.

MNE 460 three credits
Combustion Systems
3 hours lecture
Prerequisites: MNE 321, 332, 411, concurrently; consent of instructor
Review of fundamental aspects of combustion, with concentration on the following combustion systems: internal combustion engines, gas turbine power plant, fossil fuel power plant, modern solid waste incineration. Students will present special projects or several seminars.

MNE 462 three credits
Experimental Stress Analysis
3 hours lecture
Prerequisites: MNE 252, consent of instructor
The course is divided into two major parts. The first part of the course deals with theory and practice of photo-elastic methods applied to classical experimental stress analysis of models and are modified for use in photoelastic coatings. Three-dimensional problems are studied and solved by the use of the digital computer. Emphasis is on the interpretation, limitations and designing by photo-elasticity. The second part of the course presents the theory and application of mechanical and electrical strain gauges, and brittle coatings. Installation, instrumentation and circuitry of gauge set-ups or transducer use in experimental stress analysis are discussed.

MNE 463 three credits
Kinematic and Dynamic Analysis of Machines
3 hours lecture
Prerequisites: EGR 242, 301, consent of instructor
Introduction to the various types of mechanisms, their application and methods of operations. Four-bar linkages are discussed in detail with emphasis on the velocity and acceleration analysis of slider-crank, quick-return, scotch-yoke and intermittent motion mechanisms. Vector methodology is used extensively, along with graphical and complex variable methods. Different types of cams and followers are studied and profiles determined satisfying given tie-displacement requirements. Both standard and non-standard gears are treated with regard to their construction, performance, usage and geometrical features. Various types of gear trains are analyzed. Force and torque analysis of various machine parts is performed for both static and dynamic conditions. Gyroscopic devices are treated. The course concludes with the study of balance of machinery under static and dynamic conditions.

MNE 466 three credits
Control Theory
3 hours lecture
Prerequisites: ECE 212, EGR 301
Introduction to sensors used widely in control systems. Analog as well as digital control of machines and processes are discussed along with modeling of control system elements and linearization method and its applicability. Both frequency and time domain control design techniques are discussed. Algorithms for computer control and the effect of sampling on stability are developed. Applications of analog control devices and microprocessors are included

MNE 471 three credits
Physical Metallurgy
3 hours lecture
Prerequisites: MNE 231, consent of instructor
Structure of metals and alloys and their determination by x-ray diffraction. Structural imperfections and their influence on mechanical properties are covered. The electron theory of metal is introduced. Binary phase diagrams are studied on the basis of thermodynamic principles. Emphasis is placed on the iron-carbon system, and subjects like creep and fatigue are also considered

MNE 472 three credits
Metal Forming Operations
3 hours lecture
Prerequisites: MNE 231, consent of instructor
Plastic deformation in terms of dislocation theory. Various methods of the failure of metals are discussed and the field of plastic working and shaping is studied. Emphasis is on metallurgical interpretation and the influence of structure on mechanical properties. Operations such as forging, rolling, extrusion, and rod, wire and tube drawing are presented in some detail.

MNE 473 three credits
Powder Metallurgy
3 hours lecture
Prerequisites: MNE 231, consent of instructor
Characterization and production of powder Measuring techniques and bulk properties. Powder compaction methods. Behavior of powders during compaction and green properties. Sintering. Material transport and transformations during sintering. Sintering atmospheres and furnaces. Properties of sintered materials. Engineering properties and product design applications.

MNE 475 three credits
Principles of Foundry Engineering
3 hours lecture
Prerequisites: MNE 231, consent of instructor
Principles relative to the following aspects of manufacturing metal castings: nature of cast metals; solidification of castings; need and design of risers; flow of metals and gating systems; molding materials and processes; design of castings and patterns; metal melting and refining in foundries: refractories, furnaces, reactions, inoculants.

MNE 476 three credits

Manufacturing Quality Control
3 hours lecture
Prerequisites: EGR 301, consent of instructor
Principles and procedures necessary to control processes and quality of manufactured products. Topics include: product quality, quality assurance, destructive and non-destructive tests, statistical methods in quality control, acceptance sampling, rectifying inspection, sensors, automated inspection, control charts, total quality control, quality circle, quality philosophy of Deming, Taguchi, and others.

MNE 480 three credits
Computer-Aided Engineering
3 hours lecture
Prerequisites: EGR 301, MNE 252, MNE 292, consent of the instructor
The fundamental concepts of computer-aided engineering (CAE). The topics include interactive computer graphics for 3D CAE systems; CAE hardware and software; solid modeling; and finite element analysis. Emphasis will be placed on the current state-of-the-art technology, the integration of CAE systems, and future trends. The student will also be introduced to the mathematics of computer graphics. Classroom lectures will be supplemented by laboratory demonstration of interactive graphics, and interactive finite element analysis.

MNE 481 three credits
Computer-Aided Manufacturing
3 hours lecture
Prerequisite: MNE 345; Corequisite: MNE 355, consent of instructor
Scope, principles and various applications of computer-aided manufacturing. This involves the use of computers in monitoring and controlling of machine tools and manufacturing systems. The concepts of NC, CNC, DNC, computer-assisted part programming, group technology, computer-aided process planning, FMS and FMC will be discussed.

MNE 482 three credits
Robotics
3 hours lecture, 1 hour laboratory
Prerequisites: Senior standing, consent of instructor
Introduction to the various aspects of the mechanics of robotics, its classifications and terminologies involved. Direct and inverse kinematics of a robot manipulator are treated in detail with the application of homogeneous and Denavit-Hartenberg transformation techniques. Dynamics, control and programming of a robot manipulator are discussed with associated laboratory work.

MNE 485 three credits
Introduction to the Finite Element Method
3 hours lecture
Prerequisites: EGR 301, MNE 252, MNE 292, consent of instructor
Principles of the finite element method for solid mechanics. In addition, some fluid and heat flow problems will be covered. Topics include the direct method; energy methods; variational principles; interpolation functions; and the modeling of truss, beam, plate, and shell structures. This course is half theory and half computer modeling.

MNE 488 three credits
Operations Research
3 hours lecture
Prerequisite: EGR 301
Concepts and principles associated with operations research techniques for engineers, which are powerful tools for product design, production planning and control. Introduction to linear programming, formulation of linear programming, the Simplex Method, transportation model and its variants, network models, inventory models, forecasting models, Markovian decision process, and classical optimization theory. Students work in a team on a design project related to these topics.

MNE 490 three credits
Special Topics in Mechanical Engineering
3 hours lecture
Prerequisite: consent of instructor
Visiting professors or members of the faculty present current topics of interest in their areas of expertise.

MNE 491 four credits **E**
Advanced Machine Design
3 hours lecture, 2 hours laboratory
Prerequisite: Senior standing
The design of machines. The complete design process is carried out from the conceptual stage through consideration of alternative designs to final creation of the device. Extensive use of the computer is made to facilitate the process. Emphasis is placed on design and automation of electro-mechanical and electro-hydraulic systems

MNE 492 three credits
Laser Doppler Anemometry in Fluid Flow
2 hours lecture, 3 hours laboratory
Prerequisites: MNE 332, consent of instructor
Introduction to laser doppler anemometry (LDA) in fluid flow. The following topics are considered: principles of LDA; doppler effect; fringe mode LDA; seeding; frequency shifting; digital data acquisition and signal processing; time correlation; spectra; experiments on flow over a cylinder and an air foil, on turbulent jets, pipe flow and wave motion.

MNE 495 three credits
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
A student works under the direction of a faculty member to pursue a specific line of study in an area of interest to the student. The work may deal with subject matter not normally available in the curriculum, or may involve a design project. Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged. The work may deal with subject matter not normally available in the curriculum, or may involve a design project. Conditions and hours to be arranged.

MNE 196, 296, 396, 496 three credits
Directed Study
Lecture/laboratory arranged as required
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

MNE 497 two credits
Mechanical Engineering Design Project I
Prerequisite: Senior standing
Professional and management activities of project engineering, first of a two course sequence. Topics covered include engineering ethics, selection of senior design project, and initial product design leading to a written and oral presentation of project proposal. Project will be completed in MNE 498, but work done in this course is evaluated and a course grade is given.

MNE 498 two credits
Mechanical Engineering Design Project II
Prerequisite: MNE 497
Application of knowledge gained in various courses to the synthesis, analysis, and design of a system in a particular field of interest selected by student. This is the second of a two-course sequence. Design project proposed in MNE 497 will be completed, and a final report and oral presentation will be made before a panel of judges.

Note: Some graduate courses may be open to undergraduates. Please consult your department chairperson. See the *Graduate Catalogue* for graduate general and program requirements.

Graduate Courses in Mechanical Engineering

MNE 501 three credits
Advanced Engineering Mathematics
Prerequisite: EGR 301 or equivalent
Ordinary differential equations: power series solutions; solutions to Legendre, Bessel, Hermite, associated Legendre, and Mathieu equations. Partial differential equations: separation of variables; transform methods; eigenvalues; Green's function; solutions to elliptic, parabolic and hyperbolic equations.

MNE 502 three credits
Applied Numerical Methods
Prerequisite: EGR 301 or equivalent
An introduction to the tools of numerical analysis used in all areas of engineering study. Solution of linear systems and non-linear systems of equations. Numerical integration of functions ODE's and PDE's: differentiation, error control, stability and accuracy. Extensive programming in C is required.

MNE 503 three credits
Continuum Mechanics
Prerequisites: EGR 301 and MNE 252 or equivalents
A comprehensive study of the fundamental principles of Continuum Mechanics. The following topics are covered: stress, strain, and strain rated tensors; Lagrangian and Eulerian descriptions; conservation laws; constitutive relations; Navier-Cauchy and Navier Stokes equations; Newtonian fluids.

MNE 504 three credits
Advanced Mechanics of Fluids
Prerequisite: MNE 332 or equivalent
Integral Transformation: Divergence Theorem; Stokes Theorem. Reynolds Transport Theorem. Navier-Stokes equations. Kelvin's theorem. Vorticity Transport. Crocco's Theorem. Viscous flow: boundary layers, buoyancy-driven flows.

MNE 511 three credits
Theory of Elasticity
Prerequisite: MNE 503 or equivalent
Basic field equations. Generalized Hooke's law. General concepts of stress and strain. Equilibrium equations. Plane problems. Stress functions. Saint Venant torsion and flexure. Introduction to three-dimensional problems. Thermoelasticity. Anisotropic solutions.

MNE 512 three credits
Plasticity and Metal Forming Theory
Prerequisite: MNE 503 or equivalent
Tresca and von Mises yield criteria and their associated flow rules. Slip-line field theory and Geiringer velocity equations. Upper bound and lower bound theories. Application of the plasticity theories to rigid, perfectly-plastic bodies undergoing large plastic deformation in various metal forming processes such as wire drawing, extrusion, forging, deep drawing, etc.

MNE 513 three credits
Theory of Plates and Shells
Prerequisite: EGR 242, Pre or corequisite: MNE 503
Basic plate and shell equations; solutions of different shape plates. Application of cylindrical and spherical shell equations. Linear and non-linear situations. Plates on elastic foundations. Numerical solutions of plates and shells. Membrane theory.

MNE 515 three credits
Finite Element Analysis
Prerequisite: MNE 485 or equivalent
A broad study of the principles of Finite Element Analysis. The following topics are covered: energy methods; variational principles; element formulation; coordinate transformation; problems in dynamics, solids, and heat transfer; non-linear problems; numerical errors and convergence; computer modeling.

MNE 518 three credits
Advanced Physical Metallurgy
Prerequisites: EGR 231, EGR 221 or equivalents
Extending understanding of the effect of structure on the properties of metals and alloys. Deviation in various forms from perfect crystallinity will be analyzed. Metallurgical processes of typical ferrous and nonferrous alloys will be explored.

MNE 519 three credits
Metal Casting Principles
Prerequisites: EGR 231, MNE 345, MNE 411 or equivalents
Advanced concepts in solidification of alloys. Mutually dependent topics are: flow of liquid metals, transient heat transfer, phase and state change. Consequence of these in the design of sound castings will be presented.

MNE 521 three credits
Classical Thermodynamics
Prerequisite: EGR 232 or equivalent
An in-depth study of the fundamental principles of classical thermodynamics. The following topics are covered: equilibrium; temperature; equations of state; fundamental equations; First Law for steady, unsteady and continuous systems; Born-Caratheodory formulation of the Second Law; Third Law

MNE 522 three credits
Statistical Thermodynamics
Prerequisite: EGR 232 or equivalent
The principles of thermodynamics based on a microscopic approach. The following topics are covered: statistical concepts, Kinetic Theory, Gibbsian ensembles, partition function, Liouville's theorem, Boltzmann equation and the Chapman-Enskog solution, calculation of equilibrium and transport properties.

MNE 525 three credits
Bioengineering Fundamentals
Applications of thermodynamics, fluid mechanics, and transport study to biological systems. An introduction to chemical kinetics, intercellular interactions, and basic biomechanics is also included. Emphasis is on engineering with relevance to clinical and research medical applications.

MNE 530 three credits
Simulation Modeling
Prerequisites: Advanced mathematics (EGR 301) and computer programming (EGR 102) or equivalents
Concepts and principles associated with systems simulation and modeling using contemporary software such as Simulation with Arena. Topics include probability and statistics, discrete event simulation, statistical techniques in simulation modeling. Statistical analysis is integrated for the most part into the simulation modeling, reflecting the joint nature of these activities in good simulation studies, and continuous simulation of industrial and manufacturing systems using SIMAN language. The student will work in a team producing a design project relating to these topics.

MNE 531 three credits
Advanced Dynamics
Prerequisites: EGR 242, EGR 301 or equivalents
A course of study of technologically useful topics from dynamics, such as: three dimensional motion of rigid bodies; dynamics of flexible rotors and linkages; balancing of machinery and non-linear forces and stability. Variational methods and numerical techniques will be introduced.

MNE 532 three credits
Advanced Robotics
Prerequisite: MNE 482 or equivalent

Advanced course in kinematics, dynamics and control of robots. Topics covered include: trajectory generation, position and force control of open chain and closed chain
manipulators, kinematic redundancy, link flexibility, artificial intelligence and integration of industrial robots in integrated manufacturing systems.

MNE 533 three credits
Manufacturing Automation
Prerequisite: MNE 345 or equivalent
A study of the different components of an automated manufacturing system. Design of the hardware and software used in the different manufacturing systems. Analysis, modeling, performance and economics of flexible manufacturing systems and flexible manufacturing cells. Design of parts to facilitate automatic assembly.

MNE 534 three credits
Advanced Vibrations
Prerequisites: EGR 242, EGR 301, or equivalent
Vibration of structures and machine components, free and forced vibrations, damped vibrations, normal modes, critical speeds, non-linear systems techniques, phase plane and function description methods.

MNE 536 three credits
Advanced Control Theory
Prerequisite: MNE 466 or equivalent
Advanced course in design of control systems. Topics covered include: input-output and state space description; controlability and observability of multi-input multi-output systems; pole placement; observer design and separation principle; linear quadratic optimal control; non-linear systems and linearization; Lyapunov stability theory; application to electromechnical systems.

MNE 537 three credits
Manufacturing Systems Design
Prerequisite: MNE 345 or equivalent
Advanced topics in manufacturing systems design and analysis with emphasis on modeling and integration methodologies. Specific topics include production flow analysis, group technology, manufacturing cell design, facilities location and work design, material handling systems and automated guided vehicles, flexible manufacturing systems, and systems evaluation. Term design projects are required using computer and software tools.

MNE 538 three credits
Manufacturing Planning and Control
Prerequisite: EGR 301 or equivalent
Advanced topics in manufacturing production planning and control with emphasis on design and resource utilization. Specific topics include operations planning and control, linear programming, capacity planning, resource material planning, inventory control, project scheduling, and manufacturing cost analysis. Term design projects are required using computer and software tools.

MNE 539 three credits
Engineering Optimization
Prerequisite: EGR 301 or equivalent
Advanced topics in engineering optimization with emphasis on the algorithm and applications. Specific topics include linear and nonlinear optimization, mathematical modeling, constrained optimality criteria, transformation methods, constrained direct search, quadratic approximation methods for constrained problems, and comparison of constrained optimization methods. Term design projects are required using computer and software tools.

MNE 541 three credits
Heat Conduction
Prerequisite: MNE 411 or equivalent
Basic heat transfer modes. Steady one dimensional problems with or without heat sources, constant or variable properties. Concepts of thermal resistance. Multidimensional heat conduction problems. Transient problems. Numerical treatment of heat conduction problems. Special applications in heat conduction field.

MNE 542 three credits
Convective Heat Transfer
Prerequisite: MNE 411 or equivalent
Boundary layer flow problems: laminar and turbulent plows. Thermal boundary layer plows. Dimensional analysis. Forced convection problems. Free convection problems. Duct flows. Boiling and Condensation. Special convection problems. Heat Exchange Design. Applications.

MNE 543 three credits
Radiation Heat Transfer
Prerequisite: MNE 411 or equivalent
Basic concepts and fundamental relations of thermal radiation. Radiation field; Kirchoff's laws. Radiation density. Radiation pressure. Blackbody radiation. Graybody radiation. Radiative heat exchanges among surfaces, in enclosures. Radiation through weakly absorbing media.

MNE 551 three credits
Compressible Fluid Flow
Prerequisite: MNE 431 or equivalent
Conservation laws. Wave propagation in compressible media. Isentropic flow. Normal and oblique shock waves. Prandt-Meyer flow. Converging-diverging nozzles and supersonic diffuses. Supersonic oblique shock diffuses. Exit flow for underexpanded and overexpanded supersonic nozzles. Fanne line flow. Rayleigh line flow.

MNE 552 three credits
Computational Fluid Mechanics
Prerequisite: MNE 504
Solutions to Navier-Stokes equations. Finite difference methods: Lax-Wendroff, MacCormack, Rusanov, implicit, forward-time and centered-method, leap-frog/ Dufort-Frankel, ADI, predictor-corrector methods. Grid generation. Accuracy and convergence.

MNE 560 three credits
Methods of Experimental Research
Prerequisite: Graduate standing
The need and subject matter of research. Laws, truths, analogy and hypothesis. Identifying and clustering parameters. Use of models. Experimental setup. Induction, deduction, statistics, and conclusions. Presentation and use of finding.

MNE 570 three credits
Reading and Research
Prerequisite: Graduate standing and approval of student's graduate committee
Independent study under faculty supervision. Intensive literature search culminating in a technical report. Oral presentation at the option of the faculty.

MNE 580 six credits
Masters Thesis
Prerequisites: Graduate standing, Thesis Option, and approval of the student's Graduate Committee
Thesis research on an experimental or theoretical project in mechanical engineering under a faculty advisor. A formal thesis must be submitted to fulfill the course requirements.

MNE 590 six credits
Masters Project
Prerequisites: Graduate standing, Project Option, and approval of the student's Graduate Committee
Project research in conjunction with industry under a faculty advisor. A formal report must be submitted to fulfill the course requirements.

Physics

Faculty and Fields of Interest

Physicists are involved in theoretical studies, in experimental research, and in the development of new devices to uncover the mysteries of nature; they probe the depths of space, design and program computers, solve environmental problems, teach science, and investigate the structure of nuclei. Research in physics has often paved the way for technological innovations such as lasers, fusion power, solar cells, diagnostic techniques in medicine, and solid-state electronics. Physicists lead some of the world's major technology companies. Physicists spearheaded the development of the vast Internet computer network.

The powerful array of technical skills acquired by physics majors—critical thinking and problem solving, computers, electronics, mathematical analysis, technical writing—are of practical importance in many areas of theoretical and applied science. Employers value the broad training, versatility, and laboratory experience of physics graduates.

In addition to experiencing the department's course offerings, students are encouraged to participate in research in physical oceanography, particle physics, theoretical physics, liquid crystals, (electro-)optics, traffic engineering, computational physics, physics education and astronomy. In addition, many possibilities exist for physics students to study and participate in research in closely allied areas such as computer science, acoustics, electro-optics with faculty in departments in engineering, science, and mathematics.

The physics department has equipment including computers, lasers, x-ray apparatus, and a fully-equipped observatory with a new state of the art 16 inch Meade computer-controlled telescope and electronic CCD imaging camera. A significant number of our faculty and students are involved in the Marine Science program offered through the newly established system-wide Intercampus Graduate School (IGS) of Marine Science and Technology.

Jim Bisagni satellite oceanography, physical oceanography, and physical-biological interactions

Renate Crawford liquid crystal displays, polymer-liquid crystal composites, physics education and outreach

Avijit Gangopadhyay physical oceanography, ocean modeling and prediction, ocean-atmosphere interaction, El Nino and climate system dynamics and modeling

Alan Hirshfeld astrophysics, history of astronomy

Elliott Horch observational astronomy, astrophysics, astronomical imaging systems

Jong-Ping Hsu symmetry principles and gauge field theories

Grant O'Rielly photonuclear physics at intermediate energies, few-body systems, pion photoproduction, fundamental nuclear energies

Amit Tandon fluid dynamics, physical oceanography, environmental, and computational physics

Jay (Jianyi) Wang theory and simulations of electronic, atomic and optical processes, ion-solids and ion-surface interactions, computational physics

Marguerite Zarrillo traffic engineering, queuing, computer simulation and modeling of surface transportation, active galactic nuclei, radio astronomy, and astrophysics

Faculty in Related Fields

Several members of other departments teach courses with a large component of physics and carry out research in areas which may interest physics students. The following faculty members are included in this category. Students should always feel free to propose interdisciplinary projects, even if faculty involved are not on this list:

David A. Brown acoustics and transduction

John R. Buck underwater acoustics and signal processing

Lee E. Estes electro-optics, underwater systems

Dana Fine applied math, gauge theory

Mission

As the focus of its mission, the Physics Department works to provide its students with:

1
a comprehensive, high-quality education in the physical sciences;

2
a flexible curriculum that allows students to tailor their education according to their specific interests;

3
the opportunity to experience the excitement of scientific discovery through direct participation in faculty research;

4
an increased awareness of the physical processes in the surrounding world;

5
the essential knowledge and analytical tools with which to pursue post-graduate education in a variety of physics-related fields;

6
the foundation for eventual success in any of a broad array of careers; and

7
the motivation for a lifelong love of learning.

Physics Major
BS degree

Physics Major
Conventional Option

Requirements

Career plans of the physics major may include graduate study in physics, materials science, biophysics, geophysics, oceanography, medical physics, or in various branches of applied science or engineering. Other physics majors establish careers in industrial or government laboratories or teach in secondary schools. A major in physics is sometimes selected by students wishing to enter the professions of law, business, or medicine with the competitive edge that a good physics background can provide.

The advanced courses selected during the third and fourth years should be consistent with the students' interests and goals. These interests may be in physics or in allied fields such as astronomy, computer science, environmental science, biophysics, meteorology and oceanography.

Students are encouraged to arrange supervised independent study as well as work on individual research projects. There are frequent opportunities for student participation in faculty research.

Students should consult frequently with their departmental advisors and familiarize themselves with department activities such as the meetings and special lectures of the Physics Club.

The department also offers a graduate program leading to the Master of Science degree in physics and, in conjunction with UMass Amherst, offers a cooperative PhD program.

Of the 120 credits needed for a Bachelor of Science degree in physics, the department requires 45 credits in physics, 12 credits in specified courses in mathematics, and 6 credits in courses in a second science or mathematics or engineering. The recommended course sequence of required and recommended mathematics courses is given. Of the 120 credits, 30 must be in the upper-division. Each student is required to consult with his or her advisor before registering for courses.

		Semester Credits	
First Year		**First**	**Second**
EGR 107, 108	Intro. Engineering through Applied Sci. I, II[1]	3	2
PHY 111 (or 113)	Physics for Science & Engineering I[2]	4	
PHY 112 (or 114)	Physics for Science & Engineering II[2]		4
MTH 113 (or 111)	Calculus for Applied Sci. and Engineering I	4	
MTH 114 (or 112)	Calculus for Applied Sci. and Engineering II		4
ENL 101, 102	Critical Writing and Reading I, II	3	3
	General Education		3
		14	**16**
Second Year	(Recommended Sequence)		
PHY 115	Introduction to Classical Physics	3	
PHY 213	Applied Modern Physics		3
PHY 225, 227	Introductory Experimental Physics I, II	2	1
PHY 234	Intermediate Mathematical Physics		3
MTH 213 (or 211)	Calculus for Applied Sci. and Engineering III	4	
MTH 212	Differential Equations I (recommended)		3
ENL 266	Technical Communications		3
CIS 115	Computer Programming with C[3]	3	
	General Education	3	3
		15	**16**
Third Year	(Recommended Sequence)		
PHY 341, 342	Modern Physics and Quantum Mechanics I, II	3	3
PHY 300	Undergraduate Seminar	3	
PHY 313	Mechanics	3	
MTH 321, 322	Topics in Applied Math I, II (recommended)[4]	3	3
	Physics Electives (minimum required)[4]		3
	General Education	3	6
		15	**15**
Fourth Year	(Recommended Sequence)		
	Advanced Laboratory Requirement[5]	3	3
	General Education	3	
	Physics Electives (minimum required)	3	1
	Additional Physics Electives or Free Electives	6	10
		15	**14**
	Total credits		**120**

1 Students who transfer from another school or who change their UMmass Dartmouth major to Physics should see their advisor for substitute courses.
2 A grade of 'C' or better is required for physics majors in the PHY 111/112 or PHY 113/114 sequence.
3 Other computer courses may be substituted for CIS 115, as approved by advisor.
4 MTH 321/322 are recommended OR students must take a total of six credits of science or mathematics or engineering courses offered by the following departments: biology, chemistry, computer and information science, mathematics, civil engineering, electrical computer engineering or mechanical engineering. 200- or 300-level physics courses in the area of astrophysics are also eligiblet. The courses must be acceptable for credit to students majoring in the respective science or engineering departments, and be approved by the advisor.
5 Upper-division Laboratory requirement: a minimum of 6 credits must be selected from the laboratory courses PHY 321, 322, 421, 422—included in total of minimum required physics electives (ECE 211, 251 may substitute for PHY 321).

Physics Electives are listed on the following page.

General Education Departmental Requirement

Students majoring in Physics will meet their departmentally-controlled General Education requirements as follows:

Area E: Select a course from the approved list
Area I, Tier 2: CIS 115 or other CIS/ computer course approved by advisor
Area W, Tier 2: ENL 266 or PHY 115
Area O: PHY 115

Physics Major
Materials Science Option

Requirements

Materials science is a rapidly developing field that includes theoretical and experimental studies relating to solid state microelectronics, liquid crystals, superconductors, optical fibers, metallic alloys, ceramic materials, gravity-free processing, and other advanced applications.

		Semester Credits	
First Year		**First**	**Second**
EGR 107, 108	Intro. Engineering through Applied Sci. I, II	3	2
PHY 111 (or 113)	Physics for Science & Engineering I	4	
PHY 112 (or 114)	Physics for Science & Engineering II		4
MTH 113 (or 111)	Calculus for Applied Sci. and Engineering I	4	
MTH 114 (or 112)	Calculus for Applied Sci. and Engineering II		4
CHM 151, 161	Princ. Modern Chem. I / Applied Chem. I	4	
CHM 152, 162	Princ. Modern Chem. II/ Applied Chem II		4
ENL 101	Critical Writing and Reading I		3
		15	**17**
Second Year			
PHY 115	Introduction to Classical Physics	3	
PHY 213	Applied Modern Physics		3
PHY 225, 227	Introductory Experimental Physics I, II	2	1
PHY 234	Intermediate Mathematical Physics		3
MNE 231	Materials Science[1]	3	
MTH 213 (or 211)	Calculus for Applied Sci. and Engineering III	4	
ENL 102	Critical Writing and Reading II	3	
ENL 266	Technical Communications		3
CIS 115	Computer Programming with C[2]		3
		15	**13**
Third Year			
PHY 313	Mechanics	3	
PHY 321, 322	Electronic Devices and Circuits I, II[3]	3	3
PHY 341, 342	Modern Physics & Quantum Mech I, II[1]	3	3
CHM 315, 316	Physical Chemistry I, II[1]	4	4
PHY 300	Undergraduate Seminar	3	
	General Education		6
		16	**16**
Fourth Year			
PHY 441	Statistical Thermodynamics[1]	3	
PHY 442	Elements of Solid State Physics[1]		3
	General Education	6	6
	Free Electives		3
	Physics Electives***	6	3
		15	**15**
	Total credits:		**122**

1 Required courses for materials science option (beyond those for Conventional Option)

2 Other computer course may be substituted for CIS 115, but must be approved by advisor.

3 Upper-division Laboratory requirement: a minimum of 6 credits must be selected from the laboratory courses PHY 321, 322,421, 422— included in total minimum required physics electives (ECE 211, 251 may substitute for PHY 321).

Electives: Conventional Physics Option

PHY 251, 252	Elem. Astrophysics I, II
PHY 301	Undergraduate Seminar
PHY 314	Wave Motion*
PHY 315	Fluid Mechanics Supplement (Corequisite MNE 332)
PHY 321, 322	Electronic Devices and Circuits*
PHY 351, 352	Physics of the Environment
PHY 363	Intermediate Astrophysics
PHY 411, 412	Electric and Magnetic Fields I, II*
PHY 421, 422	Advanced Physics Laboratory I, II*
PHY 441	Statistical Thermodynamics
PHY 442	Elements of Solid State Physics
PHY 495	Independent Study
PHY 480	Undergraduate Research
PHY 490	Senior Thesis
PHY 510	Special Topics in Physics
PHY 521	Computational Physics
PHY 531	Intermediate Quantum Mechanics I*
PHY 543	Statistical Thermodynamics
PHY 550	Fundamentals of Physical Oceanography

* Students who intend to continue their studies in physics at the graduate level should consult with their advisors. A typical course selection for students planning on attending graduate school is indicated above by a star after the course number.

Recommended Electives: Materials Science Option

ECE 231	Electrical Material Science**
EGR 232	Engineering thermodynamics
PHY 314	Wave Motion*
PHY 411, 412	Electric/magnetic Fields I, II*
MNE 471	Physical Metallurgy
PHY 531	Intermediate Quantum Mechanics I*
CHM 523	Thermodynamics

* Recommended for graduate-school bound students

** Requires a minimal knowledge of circuit theory — PHY 321 is sufficient

Alternative Paths Program Requirements
Depending on the results of placement testing, new freshman students may be placed into one of the following first-year curricula in lieu of the standard curriculum.

		Semester Credits	
		First	**Second**
First Year Courses for Precalculus-Ready Freshmen			
ENL 101,102	Critical Writing and Reading I, II	3	3
CHM 153	Principles of Modern Chemistry for Engineers		3
MTH 131	Precalculus	3	
MTH 113	Calculus For Science and Engineering I		4
PHY 111	Physics for Science and Engineering I		4
PHY 162	Science, Technology, and Society II: Environment	3	
EGR 107	Introduction to Engineering Applied Science I		3
	General Education Electives	6	
		15	**17**

		First	**Second**
First-Year Courses for Algebra-Ready Freshmen			
ENL 101, 102	Critical Writing and Reading I, II	3	3
CHM 151	Principles of Modern Chemistry I		3
CHM 161	Introduction to Applied Chemistry I		1
MTH 100	Basic Algebra	3*	
MTH 131	Precalculus		4
PHY 162	Science, Technology, and Society II: Environment	3	
EGR 131	Introduction to Design		1
	General Education Electives	6	
		15	**12**

* Students receive 3 administrative credits for Math 100. Administrative credits do not count towards the total credits required for graduation.

Physics Minors

In the course of their studies, many UMass Dartmouth students acquire a background in basic physics and mathematics which enables them to take upper division physics courses. A number of these students may elect to extend their study of physics into more advanced areas. A major goal of our two physics minors is to provide encouragement and formal recognition for these students.

The Physics Minor has the additional goal of establishing the physics background needed to enter interdisciplinary fields which have a significant physics content. This would be particularly useful for students majoring in fields such as Chemistry, Mathematics, Engineering, and Computer Science. Students considering a career in fields such as Biophysics or Medical Physics would benefit from a minor in physics.

The Environmental Physics Minor focuses specifically on the physics background needed to enter interdisciplinary environmental fields which have a significant physics content.

Students who wish to enter either program must obtain approval of the Physics Department chairperson, preferably before enrolling in upper-division courses. Students who adopt one of the Physics minors must meet the university requirements of cumulative grade point averages and total number of credits. In addition, the Physics Department requires that the cumulative grade point average in physics courses submitted for recognition of completion of a minor in physics be 2.0 or above.

Physics

Requirements

		credits
PHY 113	Classical Physics I	4
PHY 114	Classical Physics II	4
PHY 213	Applied Modern Physics **OR**	3
PHY 115	Intro. to Classical Physics	3

An additional nine credits selected from the following upper division courses:

PHY 300	Undergraduate Seminar	9
PHY 313	Mechanics	
PHY 314	Wave Motion	
PHY 341, 342	Modern Physics and Quantum Mechanics I, II	
PHY 351, 352	Environmental Physics I, II	
PHY 363	Intermediate Astrophysics	
PHY 411, 412	Electric & Magnetic Fields I, II	
PHY 441	Statistical Thermodynamics	
PHY 442	Elements of Solid State Physics	
PHY 531	Intermediate Quantum Mech. I	

Total 20

Notes: Physics Minor

Certain other graduate courses may be substituted for the listed upper division courses, with the approval of the Physics Department.

A student wishing to minor in Physics must also acquire a substantial background in calculus (MTH 111, 112, and 211 or equivalent are required).

Environmental Physics

Requirements

		credits
PHY 113	Classical Physics I **OR**	3 or 4
PHY 101	Introduction to Physics I	
PHY 114	Classical Physics II **OR**	3 or 4
PHY 102	Introduction to Physics II	
PHY 351	Physics of the Environment I	3
PHY 352	Physics of the Environment II	3
PHY	300/400/500 Physics elective with an environmental theme*	3
PHY	One other Physics environmental elective**	3

Total 18-20

Notes: Environmental Physics Minor

* Fundamentals of Physical Oceanography is an example.

** Environmentally related courses include PHY 162, 163, 171, 172, and 182.

Physics Courses

PHY 030 three administrative credits*
START Science I
A laboratory based course which develops scientific reasoning skills by the study of basic physical concepts. Students study properties of matter (mass, volume, density, etc.). This course is for students accepted to the university into the special START Program. (Formerly STR 030, fall semester.)

PHY 101 three credits **S**
Introduction to Physics I
Pre- or Corequisite: MTH 101 recommended
An introductory course in physics covering mechanics, heat, and thermodynamics. Emphasis is on fundamentals and their application to practical problems. Non-calculus presentation

PHY 102 three credits **S**
Introduction to Physics II
Pre- or Corequisite: MTH 102 recommended
Continuation of PHY 101. The topics covered include heat and thermodynamics, vibrations, optics, electricity and magnetism. Non-calculus presentation

PHY 103 one credit **S**
General Physics Laboratory I
2 hours laboratory
A laboratory course that accompanies PHY 101. An introduction to experimental techniques. Experiments in mechanics.

PHY 104 one credit **S**
General Physics Laboratory II
2 hours laboratory
A laboratory course that accompanies PHY 102 or PHY 108. Experiments in optics, electricity and modern physics using electrical measurement techniques.

PHY 111 four credits
Physics for Science and Engineering I
4 hours lecture
Corequisite: MTH 113, EGR 107
A calculus-based introduction to the concepts of classical mechanics. The course is taught in an active learning mode in a computerized physics studio. Topics include one and two dimensional motion, dynamics, conservation of energy and momentum, rotational motion and angular momentum. Covers the same topics as PHY 113 in an integrated instructional mode. This course, a version of PHY 113 for the integrated freshman year curriculum in engineering, may be repeated as PHY 113

* Administrative credits do not count toward the total required for graduation.

Gen Ed note: Physics courses satisfy the Natural Science and Technology requirement. Those marked **S** below are appropriate for non-science/engineering majors. Some courses satisfy other requirements, as noted.

PHY 112 four credits
Physics for Science and Engineering II
4 hours lecture
Prerequisite: PHY 111 or PHY 113
Corequisite: MTH 114, EGR 108
A calculus-based introduction to the concepts of thermodynamics and electricity and magnetism. The course is taught in an active learning mode in a computerized physics studio. Topics include the first and second laws of thermodynamics, electric fields, flux, electric potential, elementary DC and AC circuits and magnetic fields. Covers the same topics as PHY 114 in an integrated instructional mode. This course, a version of PHY 114 for the integrated freshman year curriculum in engineering, may be repeated as PHY 114.

PHY 113 four credits **O if honors**
Classical Physics I
Includes 2-hour weekly laboratory
Prerequisite: MTH 113 or 111
A calculus based introduction to classical mechanics emphasizing problem solving. Topics include particle kinematics and dynamics, concepts of work, energy and momentum, rotational motion and oscillations.

PHY 114 four credits **O if honors**
Classical Physics II
Includes 2-hour weekly laboratory
Prerequisite: MTH 114 or 112
Continuation of PHY 113. Study of electric and magnetic fields, electric potential, capacitance and inductance, elementary circuits, electromagnetic oscillations, and optics.

PHY 115 three credits **S, W, O**
Introduction to Classical Physics
Prerequisite: PHY 111 or 113
This course treats topics in classical physics from the areas of waves, optics, and thermodynamics. Two oral presentations with technical write-ups are required.

PHY 130 three credits **S**
START Science II
Prerequisite: PHY 030 (STR 030)
A laboratory based course which develops scientific reasoning skills by the study of basic physical concepts, continuing from STR 030. Students study properties of motion (position, velocity, acceleration, etc.). This course is for students accepted to the university into the special START Program. (Formerly STR 130, spring semester.)

PHY 151 three credits **S**
Introductory Astronomy
An introduction to astronomy that surveys the content, structure, and scale of the cosmos as it is presently known. Properties of the solar system, the sun and stars, exotic objects such as pulsars and black holes, galaxies, quasars, and the universe as a whole are discussed. Each semester a different topic of current interest in astronomical research will also be covered. Evening observing sessions will be arranged.

PHY 161 three credits **S**
Science, Technology, and Society I
Interaction of science and technology with the individual and contemporary society. Topics include forensic physics, including how science and technology are used in today's judicial system.

PHY 162 three credits **E, S, G**
Science, Technology, and Society II: The Environment
This course studies current environmental issues and their relations to technological choices. For example, air and water quality are examined in relation to the use of various renewable and non-renewable energy resources. The course is non-mathematical and satisfies 3 credits of the Natural Science requirement.

PHY 163 three credits **S**
Energy and Energy Alternatives
A non-mathematical yet quantitative survey of contemporary energy questions. Energy sources such as coal, oil, natural gas, solar energy, and wind power are examined. Energy conservation techniques are examined in detail.

PHY 171 three credits **S**
Planet Earth and its Resources I
Origin and history of earth; composition and structure of its interior, crust, oceans, and atmosphere. Plate tectonics and sea floor spreading; seismology, vulcanism and earthquakes; magnetism of earth. Forces shaping earth's surface, faults and folds, erosion, sedimentation and weathering. Earth materials: soil, minerals and ores, igneous, sedimentary, and metamorphic materials. Earth resources: salts and fertilizers, chemical supplies, and building materials.

PHY 172 three credits **S**
Planet Earth and its Resources II
Earth resources: rare and abundant metals and their uses, history of life on earth, the fossil record. Energy and fossil fuels. Nuclear energy sources, uranium, plutonium, and deuterium. Water and its distribution, rate of use, and pollution. Atmospheric-oceanic circulation and heat balance. Weather and climate. Humanity as agent of change on planet Earth. Outlook on future.

PHY 180 three credits **S**
Scientific and Social Aspects of Solar Energy
The development of solar energy in the U.S. Individual sources both direct and indirect (biomass, wind, etc.) are examined as to current state of the art and future potential. Different development schemes such as centralized or distributed modes are considered. The goal of the inquiry will be to determine the optimum paths for future development.

PHY 182 three credits **S, G**
Introduction to the Weather
The fundamentals of atmospheric science. Basic physical principles which affect the general circulation of the atmosphere and their relation to the day-to-day sequence of weather events are discussed. As part of the course, students generate short-term forecasts using real time information available by computer from the internet.

PHY 183 three credits **S, G**
Global Climate Change
What we know about global climate change and how to understand it, and with what certainty we know it, aimed to meet the increasing need for citizens of the world to be scientifically literate about this issue. Using basic physical principles, this course concentrates on the science of climate change.

PHY 213 three credits
Applied Modern Physics
4 classroom hours weekly
Prerequisite: PHY 112 or 114
A first course in modern physics designed for engineering and physics students. It deals with basic atomic and nuclear physics and emphasizes the applied areas of modern physics that are likely to be of use in practical engineering applications.

PHY 225 two credits
Introductory Experimental Physics I
1 hour lecture, 3 hours laboratory
Introduction to techniques, equipment and data analysis in experimental physics. Develops skills in the use of instruments such as the oscilloscope and multimeter; error estimation and propagation; data analysis using computer spreadsheets; and laboratory notetaking and reporting. The lectures introduce the theory of error

analysis, interpretation of experimental data and scientific ethics.

PHY 226 three credits
Introductory Experimental Physics II (long version)
2 hours lecture, 3 hours laboratory
Prerequisite: PHY 225 or permission of instructor
Continuation of PHY 225. The lecture portion introduces the computer as a tool in physics for acquiring, analyzing and displaying experimental data, and computers are used for solving differential equations and simulating dynamical problems.

PHY 227 one credit
Introductory Experimental Physics II (short version)
3 hours laboratory
Prerequisite: PHY 225 or permission of instructor
Continuation of PHY 225.

PHY 234 three credits
Intermediate Mathematical Physics
3 hours weekly
Prerequisites: PHY 112 or 114, MTH 213 or 211
The development of the mathematical and computational tools needed for solving more advanced physics problems. Topics are selected primarily from classical mechanics and electricity and magnetism.

PHY 251 three credits
Elementary Astrophysics I
Prerequisite: One year of science or mathematics or permission of instructor
Basic concepts and modern developments in astrophysics at an elementary level. It can be used to fulfill the science requirement. Subjects to be discussed range from the solar system and the structure and evolution of the stars to galaxies and the expanding universe. Observing techniques are also taught using the observatory telescope.

PHY 252 three credits
Elementary Astrophysics II
Prerequisite: PHY 251 or permission of instructor
A continuation of PHY 251, this course consists of a more detailed analysis of subjects introduced the preceding semester. Among the topics to be considered are cosmology and high-energy astrophysics including pulsars, quasars and black holes. More advanced observing techniques are introduced, including astrophotography and electronic imaging

PHY 261 three credits **S**
Physics of Music: Waves, Wiggles, and Music
The science behind how musical instruments work, with hands-on activities and demonstration. No mathematics beyond simple algebra will be used. Topics include simple vibrators; waves on strings and in other structures; scales, temperaments, and harmony; acoustical environments: production and perception of musical tones. Previous musical experience is helpful.

PHY 271 three credits **S**
The Solar System: Exploring the Planets
3 hours lecture
Prerequisite: PHY 171
Introduction to the physical nature of the solar system. Characteristics of the planets and major satellites will be examined using lecture and WWW sites. Topics will include compositions, internal structures, atmospheres, possibilities for biological activity and the development of geologic surface features. The presentation is non-mathematical and will introduce the use of the observatory and basic astrophotography.

PHY 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

PHY 300, 301 three credits each
Undergraduate Seminar I, II
A seminar conducted at the sophomore-junior level on topics in contemporary physics, astrophysics and related topics.

PHY 313 three credits
Mechanics
Prerequisites: PHY 115, 234, MTH 211 or 213
Mechanics of particle systems including central force motion and two body scattering, accelerating coordinate systems, rigid body kinematics and dynamics, coupled oscillators, small vibrations and normal modes, introduction to Lagrangian methods.

PHY 314 three credits
Wave Motion
Prerequisites: PHY 234, MTH 211 or 213
Wave phenomena in mechanics, optics and acoustics. A study of the wave equation and its applications with emphasis on the general properties of waves. Interference, diffraction, reflection, refraction and polarization.

PHY 315 1 credit
Fluid Mechanics Supplement
1 hour lecture
Prerequisites: PHY 115, MTH 211 or 213
Corequisite: MNE 332
To enhance the background of physics students who take MNE 332. Specific topics include distributed force and moment analysis for applications to fluid statics, thermodynamic principals applied to fluid mechanics, Coriolis force in rigid bodies and in the ocean-atmospheric system, and basic force balance for the ocean and the atmospheric flows.

PHY 321 three credits
Electronic Devices and Circuits I
2 hours lecture, 3 hours laboratory
Prerequisites: PHY 114, MTH 211
A lecture and laboratory course in electronic circuit theory covering both active and passive devices and elementary networks.

PHY 322 three credits
Electronic Devices and Circuits II
2 hours lecture, 3 hours laboratory
Prerequisite: PHY 321
A continuation of PHY 321 with emphasis on applications using the elements and techniques of modern research, including integrated-circuit devices, digital circuits, and computer interfacing.

PHY 341 three credits
Modern Physics and Quantum Mechanics I
Prerequisite: PHY 213
Experimental evidence leading to the development of modern physics, Bohr-Sommerfeld theory of the hydrogen atom. Special relativity, introduction to the Schroedinger equation with solutions to simple problems leading to the study of one electron atoms. Electron spin, magnetic moment, and the fine structure in hydrogen spectra.

PHY 342 three credits
Modern Physics and Quantum Mechanics II
Prerequisite: PHY 341
Continuation of PHY 341. Further applications of the principles of quantum mechanics with applications to many particle systems. Quantum statistics, atomic spectra

of many electron atoms, nuclear structure, nuclear models and scattering.

PHY 351 three credits
Physics of the Environment I
Prerequisites: A one year course in physics and MTH 101 or 131
A course applying scientific concepts and simple mathematical modeling (noncalculus) to environmental problems. Major topics addressed include the cycling of various substances (water, carbon, sulfur, etc.) in the natural environment and effects of anthropogenic perturbations on them.

PHY 352 three credits
Physics of the Environment II
Prerequisite: PHY 351
Continuation of PHY 351. Acid rain, climatology and the "greenhouse effect". Survival of populations. More elaborate mathematical modelling, some of which involves a little calculus, but a knowledge of calculus is not a prerequisite.

PHY 363 three credits
Intermediate Astrophysics
Prerequisites: PHY 251, 252; or permission of instructor.
This course explores in greater detail topics in stellar and galactic astronomy that were introduced in PHY 251-252. Variable stars, binary stars, star clusters, and galactic structure will be discussed with an emphasis on areas of current astronomical research. Astronomical imaging and image-processing techniques will be taught using equipment at the observatory.

PHY 411 three credits
Electric and Magnetic Fields I
Prerequisite: PHY 234
Study of the fields of static charges and constant currents, the properties of dielectric and magnetic materials, and magnetic induction leading to the formulation of Maxwell's equations.

PHY 412 three credits
Electric and Magnetic Fields II
Prerequisite: PHY 411
Continuation of PHY 411. Development of the wave equation. Electro-magnetic waves in space and in matter. Study of radiation from time varying charge and current distributions.

PHY 421 three credits
Advanced Physics Laboratory I
1 hour lecture, 4 hours laboratory
Prerequisites: PHY 213, 226
Laboratory course to acquaint students with current experimental techniques in physics and methods of data analysis.

PHY 422 three credits
Advanced Physics Laboratory II
1 hour lecture, 4 hours laboratory
Prerequisite: PHY 421
A continuation of PHY 421. Projects in experimental physics with emphasis on independent work by the student.

PHY 430 three credits
Methods and Strategies for Physics Teachers
Prerequisites: PHY 111 or 113, 112 or 114, 213, 234
This course is designed for Physics teachers. It emphasizes the use of varied teaching strategies and methods to cater to different learning styles of students. Attention is given to analytic and graphic as well as intuitive presentation of physics concepts and phenomena. Teaching techniques including audio-visual aids, demonstration and hand-on experiments are used to enhance the learning experience.

PHY 441 three credits
Statistical Thermodynamics
Prerequisite: PHY 213
The laws of thermodynamics and their interpretation based on the microscopic behavior of matter. Entropy and probability, equilibrium, reversibility, thermodynamic functions, phase changes, quantum statistics. Applications to problems in solid state physics.

PHY 442 three credits
Elements of Solid State Physics
Prerequisite: PHY 342
Basic concepts of condensed matter physics, crystal structure, crystal diffraction, lattice vibrations, theory of metals, semiconductors and insulators, magnetic properties of solids.

PHY 480 three credits
Undergraduate Research
Prerequisite: Permission of department
Individual work under the supervision of a faculty member on an experimental, theoretical, or literature review project in physics. This work may lead to a senior thesis project or may be concluded by a written report at the end of the term.

PHY 490 three credits
Senior Thesis
Intensive individual work on an experimental or theoretical problem in physics under the guidance of a faculty member. The special project is to be selected at the beginning of the senior year. Credit will be assigned in the second semester.

PHY 495 three credits
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Individual study of selected topics in physics under the guidance of a faculty advisor. This course is suitable for study of physics subfields of special interest to individual students and faculty members. Conditions and hours to be arranged.

PHY 196, 296, 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Note: 500-level courses are for graduate students and advanced undergraduates. 600-level courses are for graduate students only. See the *Graduate Catalogue* for graduate general and program requirements.

Graduate Courses in Physics

PHY 501 three credits
Graduate Laboratory I
Principles of electronics and electronic instrumentation. Recommended for students with little or no prior experience in electronics.

PHY 502 three credits
Graduate Laboratory II
Continuation of PHY 501. Introduction to experimentation in physics. Recommended for students with little prior experience in conducting experiments, especially those who wish to enter into experimental research projects. Emphasis is on advanced topics and methods of data analysis.

PHY 510 three credits
Special Topics in Physics
Prerequisites: Variable, depending on topic
An advanced treatment of a special topic in physics with an emphasis on recent developments. The subject matter varies according tho the interests of the instructor and the students.

PHY 515 three credits
Physics of Ocean Boundary Layers
Prerequisites: PHY 315 and MNE 332 or equivalent; or exposure to PDEs or undergradaute fluid medchanics
Tools and the physical concepts needed to understand the physics of ocean boundary layers. This course considers tensor analysis, motion relative to a point, Bousinessq approximation, vorticity dynamics in geophysical fluid flows and the physical processes pertaining to oceanic boundary layers, surface gravity waves, and oceanic turbulence. Also discussed is surface energy exchange at the ocean-atmosphere interface.

PHY 521 three credits
Computational Physics
Prerequisites: CIS 115 and PHY 313 or equivalents
Application of computational techniques to computer simulations in physical science and engineering. The course covers physical concepts such as realistic projectile motion, planetary systems, nonlinear dynamics, chaos and fractals, and electromagnetic and quantum systems. The course exposes students to numerical algorithms and methods such as solutions to optimization, quadrature, fast Fourier transform, and boundry value problems, and gives hands-on experience in programming and computer simulations.

PHY 531 three credits
Intermediate Quantum Mechanics I
Fundamentals of quantum mechanics. Schrödinger equation, operator techniques, angular momentum, central force motion, spin, matrix representations, and elementary perturbation theory are studied.

PHY 543 three credits
Statistical Thermodynamics
The laws of thermodynamics and their interpretation based on the microscopic behavior. Entropy and probability, equilibrium, reversibility, thermodynamic functions, phase changes, quantum statistics are studies. Applications to problems in solid state physics are examined. (Formerly offered as offered as PHY 441.)

PHY 550 three credits
Fundamentals of Physical Oceanography
Prerequisite: Differential and integral calculus or permission of instructor
Fundamental physical oceanographical processes important to coastal and open ocean environments. Included in the course are lectures by current researchers in specialized topics such as satellite oceanography and numerical modeling.

PHY 611 three credits
Electromagnetic Theory I
Boundary value problems in electrostatics, Green's functions and eigenfunction expansions. Also examined are Maxwell's equations, momentum and energy of the electromagnetic field, radiation, multipole expansions, scattering, special relativity and Lagrangian formulation, radiation from moving charge, radiation reaction. (Formerly offered as PHY 522.)

PHY 612 three credits
Electromagnetic Theory II
Prerequisite: PHY 611 or equivalent
Study of simple radiating systems, scattering and diffraction of electromagnetic waves, radiation by moving charges, special theory of relativity, Lorentz transformation, covariant formulation of Maxwell's equations, relativistic particle dynamics, scattering of charged particles, radiation damping and self-fields of a charged particle.

PHY 615 three credits
Theoretical Mechanics and Relativity
The Lagrangian and Hamiltonian formulation of Newtonian mechanics. Also covered are variational principles, transformation theory, Poisson brackets, Hamilton-Jacobi theory, special relativity and the covariant formulation of particle mechanics. General relativity is introduced. (Formerly offered as PHY 521)

PHY 616 three credits
Graduate Seminar
A seminar devoted to the discussion of topics in modern physics and related subjects. (Formerly offered as PHY 575.)

PHY 621 three credits
Advanced Mathematical Physics I
Mathematical methods in physics. Linear algebra, complex variable theory, eigenfunction expansions and orthogonal functions, the special functions of mathematical physics are studied. (Formerly PHY 511.)

PHY 622 three credits
Advanced Mathematical Physics II
Continuation of PHY 511. Partial differential equations, integral equations, Green's functions, generalized functions, calculus of variations, and group theory are studied. (Formerly PHY 512)

PHY 631 three credits
Intermediate Quantum Mechanics II
Radiative processes and the theory of scattering. Other topics included are variational principles, symmetry and invariance principles, and second quantization. Relativistic quantum mechanics and field theory are introduced. (Formerly offered as PHY 532.)

PHY 632 three credits
Advanced Quantum Mechanics
Further training for students in theoretical physics on a graduate level. Explores in depth topics discussed in PHY 531 and PHY 631. (Formerly offered as PHY 533.)

PHY 635 three credits
Solid State Physics I
Basic concepts of solid state physics, including crystal structures, lattice vibrations and ionic crystals. Also examined are dielectric and optical properties of insulators, ferroelectrics, free electron theory of metals, energy bands, and semiconductors. (Formerly offered as PHY 541.)

PHY 636 three credits
Solid State Physics II
Theory of conductivity and related effects. Rectification and transistors, imperfection in crystals, plastic deformation color centers, optical properties of solids, and theory of magnetism are also studied. (Formerly offered as PHY 542.)

PHY 641 three credits
Statistical Mechanics
Prerequisite: PHY 213 or equivalent
Thermodynamics and its statistical interpretation. Canonical, micro-canonical, and grand canonical ensembles. Boltzmann, Fermi, and Bose distributions, and their applications to equilibrium and transport phenomena. Phase equilibrium is also studied.

PHY 645 three credits
Ocean Circulation and Modeling
Prerequisite: PHY 550 or permission of instructor
Theories of ocean circulation, including wind-driven and thermohaline components, and their numerical modeling. The concepts of geostrophy, Sverdrup-to-Strommel dynamics, stratification, rotation, and diffusion processes are discussed for the general circulation features in all three world oceans. Primitive equation-based numerical modeling experiments are discussed for the global-scale, basin-scale, regional-scale, and feature-based models.

PHY 651 three credits
Nuclear Physics
Structure and properties of nuclei. Also studied are nuclear forces and potentials, nuclear shell model and collective model, strong, electromagnetic, and weak interactions, nuclear reactions and decays. (Formerly offered as PHY 551.)

PHY 652 three credits
Elementary Particle Physics
Relativistic kinematics of particle motion, phenomenological and dynamical theories of particle interactions and classification of particles according to symmetry principles. (Formerly offered as PHY 552.)

PHY 655 three credits
Ocean Atmosphere Dynamics
Prerequisite: PHY 550 or permission of instructor
Ocean atmosphere dynamic interaction processes related to short-term and long-term climate variability. El Niño/southern oscillation, North Atlantic osscilation and moonsoon dynamics are discussed with the perspective of global climate change. During the semester the class will conduct a real-time monitoring experiment of the Pacific Ocean using the Internet. Also presented are advanced assimilation techniques of satellite (GEOSTAT, Topex/Poseidon, SeaWifs) and in-situ data from the World Ocean Circulation Experiment (WOCE) in numerical climate models.

PHY 660 three credits
Physical-Biological Interactions in the Ocean
Prerequisite: PHY 550 or permission of instructor
Fundamental physical-biological interactions, emphasizing the relationships between physical oceanographic processes and oceanic biology over a variety of spatial and temporal scales. This interdisciplinary course uses lectures, readings, and sample problems, and requires a mini-research project or term paper.

PHY 661 three credits
Physical Oceanography of Shallow Seas
Prerequisite: PHY 550 or permission of instructor
Physical oceanographic processes important to European and United States shallow seas, continental shelves, and banks, and their relationship to nutrients and biology (plankton and fish) in these regions. Included in the course are lectures by current researchers in appropriate topics.

PHY 662 three credits
Physical Oceanography of Enclosed Basins
Prerequisite: PHY 550 or permission of instructor
Physical oceanographic processes important to enclosed basins and their relationship to nutrients and biology (plankton and fish) in these regions. Regions of study include the Gulf of Maine, Gulf of Mexico, and Mediterranean Sea. Included in the course are lectures by current researchers in appropriate topics.

PHY 680 three credits
Graduate Project
Prerequisite: Permission of instructor
Directed research on a project in experimental, theoretical, or applied physics under the supervision of a faculty sponsor. The research may be concluded with a written report at the end of one or two terms. Graded A-F, or IP if the project is conducted across two terms.

PHY 685 three credits
Graduate Research
Prerequisite: Permission of instructor
Supervised research on an experimental or theoretical topic in physics under a faculty advisor. This course is offered only to students indicating strong intention and ability to do thesis work in subsequent semesters. The credits are considered equivalent to Thesis (PHY 690) if thesis work on the same topic is taken up later. Otherwise, a written report is required at the end of the research. Graded A-F, or IP if the work is approved to be continued as PHY 690 Thesis, in which case the grade earned when the thesis is completed will replace the IP.

Textile Sciences

The textile industry in the United States depends upon the quality of the technical and managerial leadership attracted to the industry. Technological, chemical, and marketing advances in the industry in recent years have opened the door to many career opportunities.

Today's modern textile industry is remarkably diversified, comprising a world where one can develop individual talent and specialize in aspects of manufacturing, chemistry, marketing, management, styling, and design. Textiles have their application in every conceivable field of modern day living from the products we wear, to industry, the environment, medicine, and explorations in space and the oceans.

Government and industry continue to have need for those educated in the textile sciences. More than ever, the industry relies on well-educated textile graduates to continue its manufacturing excellence, develope innovative new products, and compete in a high-tech, global market. The curriculum at UMass Dartmouth educates its students to meet these challenges and contribute to the industry's future.

Through a special student exchange program with the University of Rhode Island, students may spend one or two semesters in the Department of Textiles, Fashion Merchandising, and Design. Possible coursework includes fashion retailing, fashion buying, textile marketing, textile history, fashion history, apparel design, apparel production, and clothing and human behavior.

Students enrolled in Textile Sciences who have an interest in fashion, buying, or merchandising that extends beyond the course offerings at UMass Dartmouth are eligible to become "visiting students" at the Fashion Institute of Technology. Students are responsible for tuition and other costs assessed by the Fashion Institute of Technology.

Textile Science students can also take advantage of exchange opportunities with several universities in eastern Europe.

The Textile Sciences Department awards a number of industry-sponsored scholarships every year, based on both need and academics. Textile programs qualify under the New England Regional Student Program to allow non-resident students from the other New England states to pay a reduced non-resident tuition.

The Textile Sciences Building has approximately 15,000 square feet of laboratory space devoted to research and education, with equipment for the processing of yarn from the raw material and the conversion of these yarns into various textile structures from wovens and knits to composites and specialty products.

Equipment is also available for dyeing small lots of fibers, yarns, and fabrics both atmospherically and under pressure. A variety of chemical finishes can be applied to fabrics to produce various functional properties. Students gain experience with most wet finishing operations and evaluating performance properties during each processing stage.

Most of the research conducted by undergraduate and graduate students, in conjunction with faculty members, is in the area of materials science. The department has purchased about $700,000 in new equipment over the last seven years. UMass Dartmouth is a member of the National Textile Center and shares resources with several other universities in the U.S.

Faculty and Fields of Interest

Paul D. Calvert (chairperson) materials science, polymer and ceramic structure/property relations, biomaterials, ink jet printing

Qinguo Fan textile chemistry, chemical analysis, wastewater treatment, color science, dye chemistry

Yong Ku Kim textile engineering, fiber/polymer physics, composite materials, polymer engineering, medical textiles

Kenneth Langley flock materials, microscopy, statistics, yarn processing, natural fibers

Samuel C. Ugbolue polymer, fiber, and textile science, yarn manufacture, knitting and clothing engineering

Steven B. Warner fiber formation and properties, material science, polymers, absorbency, anisotropic wicking, nonwoven technology, microscopy, thermal analysis, biomaterials

Mission

The Department of Textile Sciences:

- Supplies appropriately educated and trained, quality graduates at the Bachelor of Science and Master of Science levels for graduate schools or leadership roles in the textile and allied industries,
- Provides research and development capability necessary for sustained improvement and long term growth in the textile sector, and
- Provides outreach programs with specialized expertise to educate and disseminate knowledge and information, and to drive the solution of increasingly complex and textile related problems.

We strive to stimulate regional as well as national industry in the fiber, textile, and associated fabricated product businesses to compete successfully in the global marketplace.

Textile Science
BS Degree

General Option

This program of study offers a unique blend of courses in the textile sciences, manufacturing, and management.

The program also enhances the student's knowledge of timely environmental issues and the linking of science and management principles to address the technological objectives of industry.

This innovative program is the result of extensive consultation with industry representatives and is designed to prepare students for a broad selection of careers.

Business Administration Minor
The courses in Business Information Systems, Accounting, Management, and Marketing, and Economics comprise a special version of the Business Administration Minor offered by the College of Business. Students' transcripts will display the Textile Science major and a Business Administration minor. *This minor is required for completion of the Textile Science major.*

Requirements

		Semester Credits	
		First	**Second**
First Year			
ENL 101, 102	Critical Writing and Reading I, II	3	3
MTH 101, 102	Elements of College Math I, II	3	3
GBA 101	The Business Organization I, II	1.5	1.5
TES 105	Contemporary Issues in Textile Science	3	
TES 110	Environmental Science and Business		3
	General Education Electives	3	6
		13.5	**16.5**
Second Year			
ACT 211, 212	Accounting I, II	3	3
TES 201	Fiber Materials		3
ECO 231, 232	Principles Micro/Macroeconomics	3	3
MGT 210	Business Statistics I	3	
MKT 211	Principles of Marketing	3	
ENL 265	Business Communications		3
	General Education Electives	3	3
		15	**15**
Third Year			
TES 300	Fabric Design and Structure	4	
TES 301	Textile Manufacturing I	4	
TES 303	Dyeing, Printing, and Finishing I	4	
TES 305	Textile Testing		3
TES 310	Statistical Quality Control	3	
TES 311	Process Optimization		3
TEC 333	Color Science		3
FIN 312	Financial Management		3
BIS 315	Information Systems	3	
MGT 311	Organizational Behavior		3
		18	**15**
Fourth Year			
TES 401	Textile Manufacturing II	4	
TES 402	Advanced Materials and Composites		3
MGT 333	Quantitative Business Analysis	3	
MGT 345	Operations Management		3
TES 410	Manufacturing Facilities Design	3	
TES 411	Managing Technology		3
TES 463	Senior Project (Research Experience/ Structured Internship)	3	
	Free Elective/Textile Elective	3	3
		16	**12**
	Total Credits:		**121**

Note: In the junior and senior years specific textile science courses are offered every other year. Upperclass students must take these courses when offered as soon as possible, otherwise they will not graduate on time.

General Education Departmental Requirements

Students majoring in Textile Science General Option will meet their departmentally-controlled General Education requirements as follows:

Area E: Satisfied by ECO 231
Area I, Tier 2: Satisfied by TES 311
Area W, Tier 2: Satisfied by ENL 265
Area O: Satisfied by TES 252

Textile Science
BS Degree

Applied Fiber Materials Option

This option emphasizes science and engineering principles and how these interact with processing and high-performance textile structures, for students who are more inclined towards careers in product development, industrial engineering, or research, rather than in management.

New freshman students will be considered for this option during an initial advising session before the beginning of their first semester. Admissions will look for a secondary school background in mathematics and science similar to that expected for admission to study in biology, engineering, medical laboratory science, and nursing.

Department Policy Statements

1
Upper-division students with at least a 2.5 grade point average may, upon approval of the department chairperson, earn up to 3 credits in experiential Learning, which may be applied to fulfill a free or a textile elective.

2
Students must consult with their academic advisor prior to registering for any classes. Transfer students should be aware of possible scheduling problems due to the sequential nature of the Department's curricula, that may cause a delay in meeting graduation requirements. Transfer students are therefore especially encouraged to meet with their academic advisor early in order to satisfy prior-year requirements as soon as possible. In any case, final responsibility for keeping pace with the curriculum and taking required courses in sequence rests with each student.

3
General Distribution Requirements: All students in the Department of Textile Sciences are required to take a minimum of 9 credits in the humanities and 9 credits in the social sciences. For majors in Textile Science, General Option, ENL 265 Business Communications counts as a humanities course and ECO 231, 232 Principles of Micro/Macroeconomics I, II count as social science courses.

Requirements

		Semester Credits	
		First	**Second**
First Year			
TES 105	Contemporary Issues in Textile Science	3	
TES 201	Fiber Materials		3
ENL 101, 102	Critical Writing and Reading I, II	3	3
CHM 151, 152	Principles of Modern Chemistry I, II	3	3
CHM 161, 162	Introduction to Applied Chemistry I, II	1	1
MTH 111, 112	Analytic Geometry and Calculus I, II	4	4
	General Education Electives	3	3
		17	**17**
Second Year			
TES 350	Environmental Science & Indr. Compliance	3	
TES 301	Textile Manufacturing I	4	
MNE 231	Materials Science	4	
PHY 113	Classical Physics I	4	
MGT 210	Business Statistics I		3
ENL 266	Technical Communication		3
MTH 211	Analytic Geometry and Calculus III		4
	General Education Elective		3
		15	**13**
TES 310	Statistical Quality Control	3	
TES 300	Fabric Design and Structure	4	
TES 303	Dyeing, Printing, and Finishing I	4	
TES 305	Textile Testing		3
TEC 333	Color Science		3
EGR 232	Thermodynamics		3
EGR 241	Engineering Mechanics I: Statics	3	
	General Education Electives	3	6
		17	**15**
Fourth Year			
TES 401	Textile Manufacturing II	4	
TES 402	Advanced Materials and Composites		3
TES 403	Mechanics of Textile Structures	3	
TES 406	Computer Applications in Textiles		3
TES 407	Fiber Reinforced Polymeric Materials	3	
TES 410	Manufacturing Facilities Design	3	
TES 411	Managing Technology		3
TES 463	Senior Project (Research Experience/ Structured Internship)		3
	General Education elective	3	
		16	**12**
	Total Credits:		**122**

Note: In the junior and senior years specific textile science courses are offered every other year. Upperclass students must take these courses when offered as soon as possible, otherwise they will not graduate on time.

General Education Departmental Requirements

Students majoring in Textile Science Applied Fiber Materials Option will meet their departmentally-controlled General Education requirements as follows.

Area E: Satisfied by TES 350
Area I, Tier 2: Satisfied by TES 406
Area W, Tier 2: Satisfied by ENL 266
Area O: Satisfied by TES 252

Alternative Paths Program Requirements
Depending on the results of placement testing, new freshman students may be placed into one of the following first-year curricula in lieu of the standard curriculum.

Textile Science: General Option

		Semester Credits	
		First	**Second**
First Year Courses for Precalculus-Ready Freshmen			
ENL 101,102	Critical Writing and Reading I, II	3	3
MTH 101, 102	Elements of College Mathematics I, II	3	3
GBA 101	The Business Organization I,II	1.5	1.5
TES 105	Contemporary Issues in Textile Sciences	3	
TES 110	Environmental Science and Business		3
	General Education Electives	3	3
		13.5	**13.5**

		First	**Second**
First-Year Courses for Algebra-Ready Freshmen			
ENL 101, 102	Critical Writing and Reading I, II	3	3
GBA 101	The Business Organization I,II	1.5	1.5
MTH 100	Basic Algebra	3*	
MTH 101	Elements of College Mathematics I		3
TES 105	Contemporary Issues in Textile Sciences	3	
TES 110	Environmental Science and Business		3
	General Education Electives	3	3
		13.5	**13.5**

Textile Science: Applied Fiber Materials Option

		Semester Credits	
		First	**Second**
First Year Courses for Precalculus-Ready Freshmen			
ENL 101,102	Critical Writing and Reading I, II	3	3
CHM 151	Principles of Modern Chemistry I		3
CHM 161	Introduction to Applied Chemistry I		1
MTH 131	Precalculus	3	
MTH 111	Calculus For Science and Engineering I		4
TES 105	Contemporary Issues in Textile Sciences	3	
TES 201	Fiber Materials		3
	General Education Electives	6	
		15	**14**

		First	**Second**
First-Year Courses for Algebra-Ready Freshmen			
ENL 101, 102	Critical Writing and Reading I, II	3	3
CHM 151	Principles of Modern Chemistry I		3
CHM 161	Introduction to Applied Chemistry I		1
MTH 100	Basic Algebra	3*	
MTH 131	Precalculus		4
TES 105	Contemporary Issues in Textile Sciences	3	
TES 201	Fiber Materials		3
	General Education Electives	6	
		15	**14**

* Students receive 3 administrative credits for Math 100. Administrative credits do not count towards the total credits required for graduation.

TES 105 three credits **S, E**
Contemporary Issues in Textile Sciences
A student-centered, discovery-oriented, laboratory-based science course dealing with fundamentals and basic quantitative aspects of textile sciences and the textile industry. Emphasis is placed on the fundamentals of fibers, yarns, and fabrics, their properties, usage, quality aspects and relationship to the finished product. Flowcharts are used to describe the various textile processes and specific products are selected and dissected. Federal legislation and relevant international trade agreements as the relate to textile are considered. Students learn about various opportunities within the textile industry and visit two different textile plants/facilities.

TES 110 three credits **S**
Environmental Science and Business
Physical sciences and technologies for business persons to deal intelligently with their responsibility of protecting the environment. Fundamental scientific principles are discussed in the context of the geology of groundwater, soil contamination and its remediation, use/safe handling and disposal of hazardous industrial chemicals/wastes and industrial air pollution and its control. OSHA-regulated issues like toxic materials use and in-plant noise pollution are also discussed.

TES 201 three credits **S**
Fiber Materials
Prerequisite: Sophomore standing
The molecular structures and morphologies of fibers. A foundation is provided for understanding the physical, chemical and mechanical properties and behavior of fibrous structures. Production processes and applications are also examined.

TES 252 one credit
Textile Seminar
Prerequisite: Sophomore standing
Discussions and presentations on textile materials, processes and products. Students learn to interrelate knowledge from all areas of textile - fibers, yarns, fabrics, dyeing, finishing, and end products and gain an understanding of the continuity from course to course in the Textile Science Program.

TES 262 three credits **S**
Microscopy
Various microscopic techniques in fiber identification and structure, composition of blends, physical, chemical, and biological conditions of fibers and yarns. Students are taught the principles of various microscopic and photomicroscopic techniques—scanning electron, optical, polarized light, atomic force, and so on—as well as introduced to the principles of image analysis.

TES 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged Graded CR/NC. For specific procedures and regulations, see selection of catalogue on Other Learning Experiences.

TES 300 four credits
Fabric Design and Structure I
3 hours lecture, 1 hour laboratory
Prerequisite: upper-division standing
A study of the interaction of basic designs and processing dynamics on the aesthetic, physical and functional properties of fabric structures.

TES 301 four credits
Textile Manufacturing I
3 hours lecture, 1 hour laboratory
Prerequisite: Upper-division standing
An examination of current and emerging systems employed in conversion of fibers into textile yarn structures. The relationships between material/process constraints and product functional quality are analyzed.

TES 303 four credits **S**
Dyeing, Printing and Finishing I
Prerequisite: TES 201
The principles of dyeing, printing, and finishing of textile materials. Basic characteristics of dyes, chemical structure of dyes and fibers, detergent and scouring, classification of dyes and fibers, color and chemical composition are studied. Dyeing equipment and the specific dyes and procedures used to dye textiles are also examined.

TES 305 three credits
Textile Testing
2 hours lecture, 3 hours laboratory
Prerequisite: Junior standing
Determination of raw material, and manufactured textile product conformance to specifications, and process/product evaluation by physical, chemical and microscopic methods. Standard test methods of industrial laboratories are employed. Laboratory test reports are generated by students from the data collection and analysis.

TES 310 three credits
Statistical Quality Control
Prerequisite: MGT 210
The vision of never-ending improvement in quality Statistical quality control charts are developed for implementing and maintaining economic control of processes. Diagnostic techniques for determining faults are explored.

TES 311 three credits **I**
Process Optimization
Prerequisite: TES 310
The process of moving from the control stage to continuous improvement. Using computer workshops and the experimental methods developed by Taguchi and Box, opportunities are identified for finding and sustaining breakthroughs in improved quality.

TES 312 three credits
Fabric Design and Structure II
Prerequisite: TES 300
Advanced woven fabric design and structural analysis pertaining to compound fabric structures involving extra warp and/or weft systems, layered fabrics, and leno constructed fabrics. The student is expected to understand and develop commercially viable complex fabric. Students learn how to apply computer design software for proper woven structure layout and development.

TES 331 three credits
Textile Technology
A course designed for Textile Design students that covers the theory and procedures employed in the processing of raw materials into yarns and fabrics, including natural and manufactured fibers.

TES 350 three credits **E**
Environmental Science and Industry Compliance
Prerequisite: Upper division standing
A study of environmental science, technology, and compliance issues relevant to modern industrial manufacturing practice. The applied science of environmental pollution remediation technology is reviewed in the context of laws, regulations, and ethics. Issues of importance to the textile, chemical product, and related manufacturing industries are emphasized.

TES 352 three credits
Seminar
A program designed to improve oral communication skills by learning and using concepts in textile sciences. Students attend seminars presented by outside speakers, faculty, and graduate students and then each student prepares a seminar for the class.

TES 401 four credits
Textile Manufacturing II
Prerequisite: TES 301
The sequential processes employed in the conversion of textile yarns into woven fabric. The course focuses on the interaction of processing conditions, both from traditional and advanced technologies, on woven fabric quality. Consideration is also given to dedicated information systems.

TES 402 three credits
Advanced Materials and Composites
Prerequisites: Senior standing
Processes used for producing functionally-advanced fibrous materials: non-woven fabrics bonded by mechanical, chemical or thermal techniques; spunbonded, spunlaced and meltblown systems. Braided and knotted structures, fabric coating systems, assemblage of fabrics by stitching, chemical and high radio frequency bonding, and advanced composite materials are considered.

TES 403 three credits
Mechanics of Textile Structures
Prerequisite: Senior standing in applied fibers option
Study of the basic mechanics of fibrous assemblies. Topics included are geometry and mechanical behavior of twisted, woven, knit, and non-conventional structures under various stress conditions, and end use application.

TES 404, 405 three credits
Processing Dynamics I, II
Prerequisite: upper-division standing in applied fibers option
Theoretical analysis of the dynamics and machine-fiber assembly interaction in textile fabrication processes. The inter-relations between mechanics of production and mechanical properties of yarns, fabrics, and other fiber assemblies are studied. Unit operations required to process fibers to the finished products are considered.

TES 406 three credits
Computer Applications in Textiles
Prerequisite: Knowledge of PCS and textile manufacturing; Upper class standing
A survey of computer applications and computer integrated manufacturing (CIM) systems in textiles. The course covers automatic process control, quality monitoring, and manufacturing data acquisition supported by microprocessors and personal computers. Course involves extensive hands-on assignments using MS-DOS, Spreadsheet (LOTUS 1-2-3), word processing, business graphics, databases, and BASIC programming software.

TES 407 three credits
Fiber Reinforced Polymeric Materials
2 hours lecture, 3 hours laboratory
Prerequisites: TES 201, 301
An introduction to advanced composite materials employing fiber reinforcement. Also studied are resins for polymeric matrices, reinforcing fibers, and properties of the resulting structures. Manufacturing techniques and testing of composite materials are examined.

TES 408 three credits
Jaquard Fabrication
Prerequisites: TES 300, 312; or permission of instructor
The execution of complex woven structures for the high end apparel and home furnishings fabric markets. Artistic and technical skills are combined to produce jacquard woven fabrics which are aesthetically and functionally appealing. Color, yarn selection and design are manipulated and organized on a state-of-the art CAD system.

TES 410 three credits
Manufacturing Facilities Design
Prerequisite: Senior standing
A study of the design of a new manufacturing plant. General consideration is given to plant design and layout installation, plant service functions, and engineering economy related to plant engineering. New manufacturing methods and processes in industry are surveyed. Computer-aided design and manufacturing (CAD/CAM) concepts and practices are considered in developing layouts of theoretical process- and/or product-oriented plants. Service facilities design is also considered.

TES 411 three credits
Managing Technology
Prerequisite: Senior standing
Understanding the impact of technology on manufacturing and society. The course analyzes the effects of technology on society and various business functions, such as product design, manufacturing processes, marketing strategies, and research and development. Topics include technical innovation, entrepreneurship, and patent protection. Ethical issues related to technology, including product liability, industrial espionage, and the environment, are discussed.

TES 463 three credits **O, W**
Senior Project
Prerequisite: Upper class standing
Exposure to and experience in timely research and development projects either in the laboratory or a real world setting—at companies in the area. Most but not all topics will be in the area of textile sciences: (a) Product Design and Analysis or Reverse Engineering; (b) Plant Design, Marketing, Business Strategy Research based on library work; (c) supervised lab intensive project; (d) Directed/Independent Study with Industrial Internship.

TES 465 three credits
Textile Merchandising and Marketing
Case histories and general discussions of the following subjects: the marketing of textile fibers, yarns, fabric, and garments; the influence of style and fashions on textile industry products; and price policies and other problems characteristic of the textile industry.

TES 475 three credits
Textile Cost Accounting
Principles and problems basic to textile costing; basic cost concepts, cost problems; materials, labor; and manufacturing costs; textile fiber and supplier purchasing; spinning, weaving, and finishing mill costs; textile marketing costs, and financial statements.

TES 482 three credits
Fabric Design for Function
A case study in the development of textile fabrics that have engineering designs to provide specific properties. Examples include dome structures, geotextiles, bullet-proof vest, artificial turf, and medical fabrics. The courses correlates properties of textile materials, engineering principles in textile processing, and the design of fabric structures with the desired properties for a particular functional use.

TES 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

TES 196, 296, 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Textile Chemistry Major

BS degree

The Textile Chemistry program offers students the opportunity to prepare for careers in the application of chemistry to the coloration and alteration of the aesthetic and functional properties of textile materials. Students receive a thorough understanding of chemistry in addition to specialized instruction in the chemistry of fibers, dyes, finishes, and the applicable technology of manufacturing.

Requirements

		Semester Credits	
		First	**Second**
First Year			
TES 105	Contemporary Issues in Textile Science	3	
CHM 151, 152	Principles of Modern Chemistry I, II	3	3
CHM 165, 166	Introduction to Experimentation I, II	2	2
MTH 111, 112	Analytic Geometry and Calculus I, II	4	4
ENL 101, 102	Critical Writing and Reading I, II	3	3
CHM 172	Intro. Computer Programming for Chemists		1
	General Education Elective		3
		15	**16**
Second Year			
TES 201	Fiber Materials		3
MTH 211	Analytic Geometry and Calculus III	4	
CHM 251, 252	Organic Chemistry I, II	3	3
CHM 265, 266	Organic Chemistry Laboratory I, II	2	2
PHY 113, 114	Physics, I, II	4	4
ENL 266	Technical Communications		3
		13	**15**
Third Year			
TES 300	Fabric Design and Structure	4	
TES 303	Dyeing, Printing, and Finish I	4	
CHM 305	Modern Methods of Chemical Analysis	3	
CHM 307	Procedures of Chemical Analysis	2	
CHM 315, 316	Physical Chemistry I, II	4	4
TES 406	Computer Applications in Textiles		3
TES 305	Textile Testing		3
	General Education Electives		6
		17	**16**
Fourth Year			
TEC 420	Adv. Topics in Dyeing, Printing,& Finishing	3	
TES 350	Environmental Sci. & Indust. Compliance	3	
TEC 463, 464	Senior Thesis	3	3
TEC 533	Computer Color Matching		3
TEC 410	Polymer Chemistry		3
	General Education Electives/Textile elective	6	6
		15	**15**
	Total Credits:		**122**

Note: In the junior and senior years specific textile science courses are offered every other year. Upperclass students must take these courses when offered as soon as possible, otherwise they will not graduate on time.

General Education Departmental Requirements

Students majoring in Textile Chemistry will meet their departmentally-controlled General Education requirements as follows:

Area E: Satisfied by TES 350
Area I, Tier 2: Satisfied by CHM 172
Area W, Tier 2: Satisfied by ENL 266
Area O: Satisfied by TES 252

Alternative Paths Program Requirements
Depending on the results of placement testing, new freshman students may be placed into one of the following first-year curricula in lieu of the standard curriculum.

		Semester Credits First	Second
First Year Courses for Precalculus-Ready Freshmen			
ENL 101,102	Critical Writing and Reading I, II	3	3
CHM 153	Principles of Modern Chemistry for Engineers		3
MTH 131	Precalculus	3	
MTH 113	Calculus For Science and Engineering I		4
PHY 111	Physics for Science and Engineering I		4
PHY 162	Science, Technology, and Society II: Environment	3	
EGR 107	Introduction to Engineering Applied Science I		3
	General Education Electives	6	
		15	**17**

		First	Second
First-Year Courses for Algebra-Ready Freshmen			
ENL 101, 102	Critical Writing and Reading I, II	3	3
CHM 151	Principles of Modern Chemistry I		3
CHM 161	Introduction to Applied Chemistry I		1
MTH 100	Basic Algebra	3*	
MTH 131	Precalculus		4
PHY 162	Science, Technology, and Society II: Environment	3	
EGR 131	Introduction to Design		1
	General Education Electives	6	
		15	**12**

* Students receive 3 administrative credits for Math 100. Administrative credits do not count towards the total credits required for graduation.

TEC 101 three credits
Science and Technology of Human Hair
An introduction to the science and technology of human hair and hair-care products. The biology of hair loss, hair treatment, history of hair treatments and fashions, differences between scalp and body hair and the relationship between hair and physical and psychological well-being are examined.

TEC 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see selection of catalogue on Other Learning Experiences.

TEC 303 three credits **S**
The Art of Dyeing with Natural Dyes
The natural dyes used by throughout history are discussed. Methods relating to the extraction and preparation of the dyes from woods, bark and insects are studied. Laboratory work consists of the preparation of the dye-baths and the actual application of the dyes to fabrics. Logwood, cochineal, madder, fustic, indigo, quercitron, osage orange and hypernic are some of the dyes utilized. Can only be used as a Free Elective by students in the Textile Sciences Department.

TEC 325 three credits
Textile Chemistry I
Prerequisites: CHM 101, 102; or 151, 152
Introductory course in the chemistry of textile fibers, polymers, dyestuffs, surfactants, bleaching, and other chemicals used in the textile industry.

TEC 326 three credits
Textile Chemistry II
A continuation of TEC 325. An introduction to the fundamental chemistry and principles of dyeing, printing and finishing. All phases of textile wet processing will be covered in order to provide a basic understanding of these various phases of textiles.

TEC 333 three credits **S**
Color Science
Prerequisite: Junior standing
Principles of color: characteristics of color, light, colorants, and how color affects our daily life and cultural values. An integrated

Note: Textiles graduate courses are not open to undergraduates. See the Graduate Catalogue for graduate general and program requirements

approach to describing color and light is presented, incorporating not only the basic color concepts and usage, but also providing information on the vast and often hidden ways in which color affects our everyday lives. Topics on how color influences our health, spending habits, perceived image, communication, and consumer brand preferences are discussed.

TEC 402 three credits
Dyeing II
Prerequisites: TEC 303, 304
The colloid science, surface and physical chemistry of fiber/fabric dyeing. An introduction to color physics including dye formulation prediction and color matching by computer methods. Special topics on large-scale dyeing methods and recent advances in dyeing technology.

TEC 410 three credits
Polymer Chemistry
Prerequisites: CHM 151, 152 or CHM 251, 252
The physical and organic chemistry of polymers, kinetics, molecular weight determination, polymerization mechanisms, and stereochemistry.

TEC 411 three credits
Textile Printing
Prerequisites: Junior standing in TEC
Methods of printing (roller, screen dyes, pigments, transfer) and the preparation of printing pastes. Direct, discharge and resist printing methods are included.

TEC 420 three credits
Advanced Topics in Dyeing,Printing, and Finishing
Prerequisite: Senior standing in TEC
An in-depth study of dyeing, printing, and finishing, including color measurement, various types of equipment, and process controls used in industry. Students will take field trips to various industrial sites.

TEC 421, 422 three credits each
Chemical Technology of Finishing I, II
Chemical finishes which modify fabric appearance, feel, and serviceability (to shrinkage, soiling, mildew, moths, wrinkling, fire, water, static electricity, etc.) are discussed, along with the means used to apply them. The production of special effects (permanent press, crepe, moire, etc.) is also studied.

TEC 431 three credits
Industrial Chemical Analysis
Chemical analysis and testing of products associated with the textile industry: fibers, dyes, finishes, surfactants and auxiliary products, plus acids, alkalis, oxidizing and reducing agents. The various methods of analysis are critically reviewed.

TEC 433 three credits
Color Science
2 hours lecture, 3 hours laboratory
Prerequisite: Senior standing
How color affects daily life and the formation and measurement of color. Color, colorants and the coloring of materials are examined. What color means, the effect of light on color, and the results of this effect on the human eye and mind are studied. The physical and chemical processes that apply colorants to textiles and methods for incorporating colorants into paints, inks, and plastics are also examined.

TEC 442 three credits
Chemistry of Fibers
Prerequisites: CHM 251, 252, 265, 266, TEC 325
The chemistry of natural and synthetic fibers. Studies are made concerning the relationship between the chemical structure and physical properties of fibers.

TEC 463, 464 three credits each **O**
Senior Thesis
Prerequisite: Senior standing
Students prepare a thesis proposal and do laboratory research in one of the following areas: polymer chemistry, fibers, dyeing, printing and finishing. Findings are presented at the end of the second semester.

TEC 485, 486 three or six credits
Introduction to Research
Prerequisite: Junior standing
Textile Chemistry students accepted for research study by a faculty research advisor are assigned a topic for investigation. This course aims to introduce the student to research and develop his or her proficiency in the analysis, solution and presentation of his or her investigating work.

TEC 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

TEC 196, 296, 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered
Conditions and hours to be arranged

Graduate Courses in Textile Chemistry

TEC 500 eight credits
Thesis
Written presentation of an original research topic in Textile Chemistry, which demonstrates analysis, ability, and proficiency in the solution. The thesis shall be conducted under the supervision of a faculty advisor. An oral examination in defense of the thesis is required. Graded CR/F

TEC 501 four credits
Chemistry of Dyestuffs
This course deals with the chemistry and technology of dyestuffs. The raw materials, intermediates and finished dyestuffs are studied in detail. The effect of the constitution on color and fastness properties is emphasized. Theoretical as well as practical, economic, and ecological points of view are presented. The preparation of typical intermediates and dyestuffs is carried out in the laboratory.

TEC 502 three credits
Physical Chemistry of Dyeing
This is a lecture course concerned with the physiochemical theories of the application of dyestuffs to textile and related materials, including the thermodynamics and kinetic principles involved.

TEC 503 three credits
Physical Chemistry of Surface Active Agents
This lecture course is concerned with the physiochemical principles involved in surface-active agents. The chemical nature of the agents is studied and related to their properties. The technical uses are evaluated on this basis.

TEC 506 three credits
Survey of Current Textiles
Studies in this course include a survey of the fundamental reference works and literature of Textile Chemistry. Timely reports are required concerning recent advances in the manufacture, modification, dyeing and finishing of synthetics and blends.

TEC 508 three credits
Advanced Textile Printing
Prerequisite: TEC 411
The more complex styles of printing, discharge and resist, are covered in detail. The preparation of white and colored print paste for all classes of dyed backgrounds is investigated. Attention is given in dyeing ground shades for discharge printing. Special effects such as Plisse, Burn-out and Vigoreaux styles are considered.

TEC 509 three credits
Chemical Technology of Finishing
This course is more comprehensive than that given in the undergraduate course. Greater detail is provided concerning the mechanisms used in the application of specialized finishes and the chemical reactions involved.

TEC 510 three credits
Polymer Chemistry
The physical and organic chemistry of monomers and polymers, including a consideration of bonding forces, spectroscopic methods of structure determination, structure and property correlations, fractionation, thermodynamics, and methods of molecular weight determination for polymers in solution; the kinetics of condensation and additional polymerization as applied to polymers and copolymers, mechanism of free radical and ionic polymerization, stereospecific polymers, the chemistry of the more common polymers systems, and preparation of their corresponding monomers.

TEC 521 three credits
Textile Chemistry I
The mechanics of dyeing, printing, and finishing. The structures of dyes and textile fibers, detergency and scouring, and dyeing equipment and procedures.

TEC 522 three credits
Textile Chemistry II
The principles involved in the application and printing of dyes and pigments on textile materials. Topics include textile finishing and functional requirements of permanent press, softness, water repellancy, and fire retardance.

TEC 523 one-half credit
Textile Laboratory Practice I
Practice and experimentation in the dyeing of fibers with various dyes, wash and lightfastness properties, finishing.

TEC 524 one-half credit
Textile Laboratory Practice II
A continuation of TET 524, includes fiber microscopy, textile printing exercises, experiments in color science including measurement and assessment.

TEC 525 three credits
Fiber Materials
The structure and production of fibers, including molecular arrangements and morphologies. The conversion of fibers into textile yarn structures and the relationship between physical and chemical properties of fibers and processing dynamics on the yarn properties will be studied.

TEC 533 three credits
Computer Color Matching
Prerequisite: Graduate standing in textiles
A complete discussion of color science and computer match prediction in dyeing fibers, yarns, and fabrics. Objective specification of color, color difference, measurements, and various color spaces are introduced. Based on color theory and numerical analysis, computer match prediction algorithms are discussed. Practical fiber/dye data files are created and used to reproduce dyed samples with the match prediction software in accompanying computer color matching labs.

TEC 595
Independent Study
Prerequisites: Permission of instructor, graduate director, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

TEC 596 three credits
Directed Study
Prerequisites: Permission of the instructor, graduate director, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

TET 401 three credits
Advanced Yarn Technology
Prerequisites: TES 301
Discussions of the stress-strain properties of fibers and their relation to processing and product characteristics. Blends, blend systems, and the processing of blend and 100% synthetic staple material into yarns is also emphasized. Other selected topics will also be considered.

TET 419 three credits
Synthetic Fiber Processes
Prerequisite: TES 201
Synthesis of polymeric materials and their extrusion into films and fibers. Manufacture of the major synthetic fibers, namely polyamide, polyester, acrylics and polypropylene, is discussed in depth. Newer fibers such as those derived from aromatic polyamides are also covered. This course also deals with the relative merits of the various fibers in terms of economics and performance.

TET 470 three credits
Advanced Knitting Technology
Prerequisite: TES 302
A study of knit fabrics made on Raschel and Warp knitting machines, together with the creation of new designs and the formation of many types of webbing using different yarns. Charts are made of the sample to indicate the variances in types of yarns—fabric reactions from fine gauge knit lace to course webbings. Finishing requirements of these particular fabrics are studied.

Graduate Courses in Textile Technology

TET 500 eight credits
Thesis
Written presentation of an original research topic in Textile Technology, which demonstrates analysis, ability, and proficiency in the solution. The thesis shall be conducted under the supervision of a faculty advisor. An oral examination in defense of the thesis is required. Graded CR/F.

TET 501 three credits
Yarn Technology
Prerequisite: TET 511
Aspects of yarn processing which affect the properties of the product during the various stages of manufacturing. Extensive use of reference materials is required in completion of written reports on subject matter assigned. To familiarize the student with

research procedures and the evaluation of results, actual project reports will be studied.

TET 502 three credits
Yarn Technology
Continuation of TET 501.

TET 503 one credit
Research Techniques
Aids the student in better understanding research approach and techniques. To develop an insight as to the evaluation of research results. A proposal on an original research topic must be submitted and approved.

TET 504 three credits
Graduate Seminar
Student discussions on selected topics will be carried out under the supervision of a faculty member. Written papers to be submitted on those topics assigned.

TET 506 three credits
Independent Study
Prerequisite: graduate standing
Individual study under the supervision of a faculty member in an area of textiles not otherwise a part of the course offerings. Students shall be held responsible for meeting the requirements of independent study as outlined in an approved proposal.

TET 507 three credits
Textile Microscopy and Photomicrography
Prerequisite: TET 462
The use of the microscope in relation to fiber identification and structure, composition of blends, physical, chemical, and biological condition of yarns and fabrics. Recording of data by photomicrography is included.

TET 508 three credits
Design and Analysis of Experiments
Prerequisites: TET 411, TET 412
A study of the statistical methods and systems employed in the design of experiments, the testing of materials, and the evaluation of test data.

TET 511 three credits
Fabric Technology
An investigation into advanced styling and the development of methods of textile fabrication. Requirements of modification and the introduction of new procedures are studied pertaining to new design in fabric construction for improved performance and specific uses. Extensive research of reference material is conducted with written reports submitted on assigned related subject matter.

TET 512 three credits
Fabric Technology
Prerequisite: TET 511
Continuation of TET 511.

TET 517 three credits
Fiber Reinforced Polymeric Materials
2 hours lecture, 3 hours laboratory
Prerequisite: Graduate or senior standing
An introduction to advanced composite materials employing fiber reinforcement. Also studied are resins for polymeric matrices, reinforcing fibers, and properties of the resulting structures. Manufacturing techniques and testing of composite materials are examined.

TET 521 three credits
Statistical Methods of Quality Control
A study of methods and systems by the use of statistical analysis in the design of experiments, in the testing of materials and in the evaluation of test data as applied in the interest of improvement and control of quality, as well as studies of processing efficiency.

TET 522 three credits
Statistical Methods of Quality Control
Prerequisite: TET 521
Continuation of TET 521.

TET 526 three credits
Textile Manufacturing Processes
The conversion of fibers and yarns into fabric structures by weaving and nonwoven processes. Also studied are the interaction of material, design, and processing conditions on the quality of fabric and fabric structures as they relate to dyeing and finishing applications.

TET 563 three credits
Fibrous Structure
The molecular structure and arrangements of molecules in fibers are considered with respect to giving a foundation to the understanding of the physical and mechanical properties and behavior of textile raw materials. The properties are examined from a fundamental viewpoint so that a sound approach to the technological utilization of fibers in textiles can be established. An introduction is made to the interrelation between fiber properties and yarn and fabric geometry in determining the behavior of textiles.

TET 564 three credits
Mechanics of Fibrous Structures
A study of the mechanics of fibrous assemblies such as twisted structures (yarns, rope, braid), woven, knitted, and nonwoven fabrics. The methods of continuum mechanics and differential geometry to interrelate material properties and end-use properties are considered

TET 595 variable credit
Independent Study
Prerequisites: Permission of instructor, graduate director, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

TET 596 three credits
Directed Study
Prerequisites: Permission of the instructor, graduate director, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered
Conditions and hours to be arranged.

College of Nursing

Professional nurses provide health care services across the life span and in varied environments. Nursing is concerned with promoting, maintaining, and restoring health. Nursing is committed to the goal of promoting an optimal level of functioning for all individuals, families and groups, thereby contributing to the health of the nation.

Professional nurses determine health status of individuals, families, and populations and make clinical decisions regarding the appropriate action to be taken. They collaborate and cooperate with other members of the health team such as the physician, social worker, physical therapist, pharmacist, and occupational therapist. Nursing plays an essential role in advocating high-quality affordable health care for all members of society and in shaping health policy.

Professional nursing requires a broad background of knowledge in arts, sciences, and nursing, including clinical and cognitive skills of analysis, critical thinking, therapeutic intervention, and communication.

Community Nursing

Carole J. Howe community health nursing

Janet Kenty maternal-child health nursing

Jeanne M. Leffers community health nursing

Jean Maher community health nursing

Carol Mailloux maternity nursing

Sonja Stone Peterson psychiatric/mental health nursing

Joan C. Pisarczyk (chairperson) community health nursing

Sharon Sousa psychiatric/mental health nursing

Adult and Child Nursing

Gina Ankner adult health

Nancy Glasdell adult health

Judith Catalan adult health

Ellen Christian (chairperson) child health

Kimberly Christopher adult health

Phyllis Currier adult health

Nancy M. Dluhy adult health

Kathleen M. Elliot adult health

Kerry H. Fater adult health

Leslie C. Frost child and adult health

Kathryn L. Gramling adult health

Susan Hunter adult health

Mary McCurry adult nurse practitioner

Eileen S. O'Neill adult health

Elisabeth A. Pennington (dean of the college) adult health

Margaret Rudd-Arieta child health

Mission and Goals

The mission of the UMass Dartmouth College of Nursing is to provide visionary leadership that advances the practice of nursing in a dynamic environment. The college is committed to generate collaborative and consultative relationships with professional colleagues and consumers to enhance the health of individuals, families and communities. The college actualizes this mission by providing excellent nursing education, meaningful service, and scholarship that advances nursing knowledge to the commonwealth and beyond.

The College fulfills its mission by pursuit of the following goals.

1
To provide exemplary nursing education that offers learners opportunities to expand their knowledge base and pursue advanced study.

2
To foster creative and critical thinking that advances the discipline of nursing.

3
To prepare nurses who demonstrate behaviors consistent with professional nursing practice.

4
To create and sustain an environment for nursing scholarship and research within the university and beyond.

5
To prepare leaders in the delivery of cost-effective innovative health care which promotes positive consumer outcomes.

6
To integrate concepts of health within the fabric of the University and the region.

7
To expand partnerships to improve the health status of the population.

8
To facilitate the exploration of political, social, and economic factors influencing the present and future of health care. The College of Nursing at University of Massachusetts Dartmouth is approved by the Massachusetts Board of Registration in Nursing, and the baccalaureate and graduate programs are accredited by the National League for Nursing Accrediting Commission (NLNAC), 61 Broadway, New York, NY 10006; phone 212 363-5555.

The College of Nursing offers the only baccalaureate and graduate degree programs in southeastern Massachusetts. Students are admitted to one of two baccalaureate options: Students with no prior nursing education, and Licensed Practical Nurses, are admitted to the basic option. The second option, a flexible-access track for RNs, provides the opportunity for registered nurses who are graduates of associate degree and/or diploma schools to complete requirements for the bachelor's degree in nursing (RN-BS), or continue onto the master's degree (RN-MS).

The College of Nursing offers the Masters of Science Degree (MS) for Advanced Practice Nursing, with tracks for
- Adult Advanced Practice
- Adult Nurse Practitioner
- Community Nursing Advanced Practice

The College of Nursing also offers Post Baccalaureate Certificate Programs in
- Nursing Education
- Leadership/Management in Nursing

The College of Nursing also offers a Post Masters Advanced Nurse Practitioner certificate.

Other post masters courses are also offered. Please consult with the graduate program director for further information.

For details of graduate program admission requirements and curriculum, please refer to the graduate catalog.

Academic Policies for the Undergraduate Program

1
The minimum passing grade for all courses except electives is "C-."

2
Students may repeat a course only once, only as space is available, with the consent of the department chairperson and the student's advisor. A second failure (grade below C-) in the same course will result in disenrollment from the College of Nursing.

3
At the end of each program year, the student must have an overall 2.0 cumulative grade point average. At the end of the sophomore year and for subsequent program years, the student must also have a cumulative average of 2.0 in the nursing major. Failure to meet these criteria will result in academic probation.

4
After the completion of three semesters, students with a GPA of less than 2.0 in nursing major courses will be placed on academic probation. All students placed on probation must meet with their academic advisors and an individualized program plan will be developed and filed in the Dean's office. If at the completion of two subsequent semesters students do not have an overall GPA of 2.0 in the nursing major, they will be subject to academic disqualification from the nursing major.

5
The following number of credits must have been successfully completed at the end of each program year:

End of	*Credits Completed*
Freshman Year	30
Sophomore Year	62
Junior Year	92
Senior Year	122

6
A student who earns less than "C-" in 12 credits of required courses, regardless of repeating, will be disqualified from the nursing major.

7
Students have a right to appeal grades. Please refer to the grade appeal policy in the academic regulations section of the catalog.

8
Enrollment in each required NUR course can only be approved on completion of the NUR prerequisites to that course. Within a given academic year, the student may not have completed all non-nursing prerequisites for Spring semester courses; however, before the student can progress to the required NUR course for the next program year, both nursing and non-nursing prerequisites must have been completed. Early registration for a required *NUR* course does not alter these prerequisites for progression.

9
Theory and lab/clinical components of a nursing course must be taken simultaneously, and both components must be passed for successful completion of the course. The theory grade is submitted to the Registrar as the final course grade and is recorded on the transcript for both course components.

10
Status and eligibility for progression in undergraduate nursing programs are determined on the basis of an annual review conducted in June in the office of the dean. Each student receives formal written notification of status based upon the annual review.

11
Selection of students eligible for progression may be limited by the availability of faculty and/or clinical placements. In the event that the number of eligible students exceeds available resources, students will be selected on the basis of academic standing.

12
Students are responsible for being certified for cardiopulmonary resuscitation (CPR) prior to the beginning of each academic year in which they enroll in clinical courses. A copy of the certification must be on file in the Dean's office.

13
Students in the basic program must purchase student liability insurance through the university bursar's office prior to each academic year in which they enroll in clinical courses. RN students must submit a copy of current professional liability insurance to the dean's office prior to each academic year in which they enroll in clinical courses.

14
Students are responsible to provide their own transportation to clinical agencies.

15
Students are responsible to have appropriate immunizations during the summer preceding each academic year in which they enroll in clinical courses. The written reports must be on file in the university health office prior to the student's receiving a clinical assignment.

16
All students must undergo a Criminal Offense Record Investigation (CORI) before entering clinical courses. This check is administered through the College of Nursing to the Massachusetts CORI Board.

17
Any exceptions to the above academic policies will be considered by the dean only on recommendation of the student's academic advisor.

18
The faculty reserve the right to change a student's selection of clinical site in order to consolidate sections, as necessary.

Nursing BS degree

The College of Nursing offers two undergraduate programs, each leading to the degree of Bachelor of Science, the basic undergraduate program, and the RN-BSN program

The undergraduate curriculum in both programs emphasizes critical thinking, clinical decision making, therapeutic interventions, and communication skills.

The American Nurses Association Code of Ethics and Professional Standards of Practice for basic practices guides all clinical learning activities.

The baccalaureate graduate of the UMass Dartmouth College of Nursing curriculum:

- understands and exhibits the attributes of an educated, healthy, informed citizen;
- implements the concept of professional responsibility and accountability for self and colleagues as a basis for delivery of health care;
- synthesizes theoretical and empirical knowledge from the humanities, the physical and behavioral sciences and nursing as a theoretical base for assisting client systems to achieve optimal level of functioning;
- understands the research process and applies research findings to nursing practice;
- provides nursing care utilizing the nursing process: assessing, goal-setting, planning, implementing and evaluating the results of nursing intervention for individuals, families and communities;
- participates and collaborates in or manages the delivery of nursing care to the well and to the acutely, chronically and terminally ill, at any age or stage of development, irrespective of environment or client system level; and
- participates in identifying and effecting needed change to improve delivery of health care to all client system levels as a result of accurate, reliable interpretation of valid data.

Freshman Admission

Students are admitted to the basic baccalaureate nursing program through the University Office of Admissions. Applicants to the Nursing Program, in addition to fulfilling the requirements for all University students, must have had a secondary school program including at least three units of mathematics and two laboratory courses of natural sciences. The three units of mathematics must include two units of algebra.

Placement Exam—Math

Freshman students admitted to the College of Nursing must take the math placement examination before they commence studies. The results of that examination may require students to receive tutoring or additional instruction.

Admission by Transfer

All students admitted to UMass Dartmouth by transfer after having completed some course work at other colleges must meet the same entrance requirements as those who apply as freshmen.

Credits earned in another college, for which grades meet the academic policy in effect for the class to which the student is admitted, may be accepted as transfer credits after evaluation of official transcripts.

Course of Study: Basic Baccalaureate Nursing

Typical Program Plan

Studies in the sciences and liberal arts provide the base required to integrate a conceptual approach to the study of nursing that begins in the sophomore year.

In the sophomore year, students are taught to interact with individuals using successive phases of the nursing process. They acquire skills in observation and communication necessary to assess an individual's needs, set measurable and realistic goals of nursing care, and devise a plan of care to attain the goals. Students acquire the basic nursing skills to implement the care plan. They evaluate the outcome of the nursing care plan in accordance with the goals previously set.

In the junior year, the scope of the students' experiences broadens to include family groups and populations at risk. Students develop skills in caring for acutely ill adults, childbearing and childrearing families in the hospital and community, as well as populations at risk in communities. The family as a unit of care, as well as populations at risk in communities, become the foci for the nursing process.

In the senior year, the students learn to interact with persons at all levels of the hospital and long-term care structures, and with individuals in social and welfare agencies that impact the distribution of health care. The complexity of nursing care required by clients increases and students develop skills in managing complex health needs. Additionally, Critical Thinking, Oral and Written Communication, and Therapeutic Nursing intervention skills are refined.

In the last half of the final semester, students have a mentorship experience. During this experience the student works in partnership with a staff nurse taking on the full role of the registered nurse.

The basic nursing program is eight semesters long and leads to the Bachelor of Science degree.

Students may study full-time or part-time or follow a five-year curriculum plan rather than the traditional four-year plan.

All students must complete the university's general education requirements prior to graduation.

Generally students must complete one program level before progressing to the next level, because courses build on previous knowledge.

In the junior and senior year, there are two options for sequence of courses. Detailed information on those options is available from the academic advisors at the time of early registration for spring semester junior year.

Exception to progression policies or prerequisites can only be made by the Dean on recommendation of the faculty advisor.

All students take examinations to document critical thinking ability. These examinations do not affect progression or student grades. The results of these examinations are used for documentation of outcomes. Outcome evaluation of other abilities including therapeutic interventions and communication are documented by review of randomly selected student works. All students, in all programs, may have their work chosen for review. The results of these outcome reviews will be reported in the aggregate, preserving the students' privacy and anonymity. Results are used for program evaluation and accreditation.

Freshman year

During the Freshman year the student must complete the following course requirements for progression to the Sophomore year:

	Credits
ENL 101,102 Critical Writing/Reading	6
Math (101 or higher)	3
Philosophy	3
Psychology 101	3
Sociology 101	3
Natural Sciences	
CHM 101,102 General Chemistry	6
BIO 154 Fundamentals of Biology	3
NUR 105 Nutrition	3
Total	**30**

Students must have completed 30 credits by the end of the Freshman year.

Sophomore year

In the Sophomore year students begin to develop skills in nursing care. The student must complete the following course requirements for progression to the Junior year.

	Credits
Natural Sciences	
BIO 221, 223; 222, 224 Anatomy and Physiology	8
BIO 251 Medical Microbiology	3
BIO 261 Medical Microbiology Lab	1
General Education	
Social Science Requirement	3
Humanities Requirement	3
Nursing	
NUR 204 Nursing as a Health Profession — Theory and Concepts	2
NUR 240, 241 Health Assessment through the Life Span	3
NUR 290, 291 Nursing Care of Persons with Alterations in optimal level of functioning	6
NUR 303 Selected Mechanisms of Disease and Related Pharmacology	3
Total	**32**
Cumulative Total	**62**

Junior year

In the Junior year students gain nursing skill in caring for hospitalized adults and childbearing and child-rearing families. Students must complete the following course requirements for progression to the Senior year.

	Credits
General Education	
Humanities	3
Nursing	
NUR 304 Mechanisms of Disease and Related Pharmacology	3
NUR 314 Fundamentals of Nursing Research	3
NUR 320, 321 Nursing Care of Hospitalized Adults	9
NUR 332 Concepts of Family Care	3
NUR 334, 335 Nursing Care of Beginning Families	4
NUR 336, 337 Nursing Care of Children	5
Total	**30**
Cumulative Total	**92**

Senior year

In the Senior year students care for persons with complex health problems in a variety of settings.

	Credits
General Education	
Elective course	3
Humanities	3
Nursing	
NUR 420, 421 Psychiatric Mental Health Nursing	6
NUR 430, 431 Community Nursing	6
NUR 408 Contemporary Issues in Nursing	2
NUR 440, 441 Nursing Management in Long-Term Care	3
NUR 450, 451 Nursing Management in Acute Care	7
Total	**30**
Total Credits:	**122**

General Education Requirement —Basic Nursing

Students in the Basic Baccalaureate Nursing program will meet their departmentally-controlled General Education requirements as follows:

Area E: Incorporated into NUR 204, 290, 314, and 420
Area I, Tier 2: Incorporated into required NUR courses
Area W, Tier 2: Incorporated into required NUR courses
Area O: Incorporated into NUR 314, 321, 431, and 450

Nursing Programs for RNs — Baccalaureate and Combined BS-MS

The College of Nursing offers registered nurses the opportunity to advance their professional knowledge in two professional degree programs. The registered nurse may either earn a baccalaureate degree in nursing or may choose to accelerate progression in the undergraduate program and complete selected requirements for a Master of Science degree in nursing. Students who select this option must be matriculated in the baccalaureate program and may earn 9 graduate credits as part of their undergraduate study. Upon completion of the BS degree, students proceed to complete the graduate program in nursing for the MS degree.

Admission
Applicants to the RN-BS program apply for admission as transfer students through the Admissions Office. A current Massachusetts RN license is required at the time of application.

Transfer Credits

Nursing Credits
A registered nurse with an associate degree from Bristol, Cape Cod, Massasoit, or Mass Bay Community College is eligible to transfer 30 nursing credits based on articulation agreements with these programs. All others receive up to 30 transfer nursing credits based on successful achievement of selected Regents/Excelsior College challenge examinations.

Non-Nursing Distribution Credits
A maximum of 59 credits may be transferred or challenged. Students may opt to take challenge examinations in non-nursing courses through the College Level Equivalency Program (CLEP).

Academic Requirements for the RN Baccalaureate Student
University academic regulations and those described for all nursing students also apply to the Baccalaureate Program for the RN. A current Massachusetts RN license is required for admission to the RN program and must be on file at the beginning of any semester in which the student is enrolled in a clinical nursing course. Liability insurance, CPR certification, immunization status report, and CORI check are also required.

Academic Advisement
Registered nurses have unique educational and experiential backgrounds. Academic advisement considers the needs of each student. The RN Program Director in consultation with each student develops individualized program plans. It is recommended that students considering the RN options meet with the RN Program Director for informal transcript evaluation. Upon admission to the baccalaureate program a formal transfer credit evaluation is completed. Students are encourage to meet periodically with the RN Program Director to plan progression in the program..

Professor Phyllis A. Currier EdD, RN
RN Program Director
Office: Dion, 308 B
508 999-8583
pcurrier@umassd.edu

During the summer months (June - August and vacation periods), information can be obtained from the office of the Dean, 508 999-8586.

RN-BS Program Requirements

Non-nursing credits	59
Nursing Transfer Credits	30
UMass Dartmouth required Nursing credits	33
Total Credits for Graduation	122

RN students must meet the University residency requirement of a minimum of 45 credits earned at UMass Dartmouth in order to be eligible for graduation. This represents 33 required nursing credits plus 12 additional non-nursing credits.

General Education Requirement
Students in the RN-BS program will meet their departmentally-controlled General Education requirements as follows:

Area E: Satisfied by NUR 306, 314, 408
Area I, Tier 2: Incorporated into required NUR courses
Area W, Tier 2: Incorporated into required NUR courses
Area O: Satisfied by NUR 314, 321, 431, and 453

The RN—BS Course of Study

Nursing Requirements–33 credits earned at UMass Dartmouth:

NUR 105 Human Nutrition	3
NUR 302 Disease and Related Pharmacology for RN Students	3
NUR 306** Professional Nursing Concepts	4
NUR 322 Extended Assessment Skills for Nurses	3
NUR 314 Fundamentals of Nursing Research	3
NUR 332** Concepts of Family Care	3
NUR 430, 431** Community Nursing	6
NUR 408 Contemporary Issues in Nursing	2
NUR 452, 453** Nursing Management Across the Continuum of Care	6
Total	**36**

** These courses include clinical experience.

Non-Nursing Requirements–59 credits
The following 33 credits are to be completed prior to registration for the first clinical course.

English	6
Anatomy and Physiology	8
Microbiology	4
Math (101 or higher)	3
Social Sciences	12

The following 26 credits may be completed at any time.

Humanities (Philosophy)	3
Humanities electives	6
Free electives	17

Combined BS-MS Program Requirements

This fast-track program enables qualified BS degree students in the RN program track to complete both the BS and MS degrees with an overall saving of time and credits.

Eligibility
The RN student must be matriculated in the baccalaureate program and have:

- Completed non-nursing baccalaureate program requirements
- Transferred or successfully challenged 30 nursing credits
- Completed Core BS nursing courses totaling 25 credits:
  NUR 105 Human Nutrition
  NUR 302 Selected Mechanisms of Disease and Pharmacology
  NUR 306 Professional Nursing Concepts
  NUR 322 Health Assessment
  NUR 430/431 Community Nursing
  NUR 452/453 Nursing Management Across the Continuum of Care
- Earned at least a 3.2 GPA in 25 credits of core BS nursing course
- Completed the required Statistics course
- Satisfactory performance in writing proficiency

Those who qualify and are interested in ths program should provide references from two UMass Dartmouth faculty members and one employer.

Progression to MS Program
Students will take selected graduate courses as senior year elctives. Studetns will receive a baccalaureate degree with a total of 123 credits and be eligible to progress into the graduate program if a GPA of 3.0 is achieved in NUR 511, NUR 541, and NUR 520. The student will file a Nursing MS application in the Office of Graduate Studies and meet with the Nursing Graduate Program director to select a graduate program option. The completion of 30 additional graduate credits is required to complete the Master of Science degree in nursing

BS-MS Courses
NUR 511 Research Methods in Nursing (3 credits) in lieu of NUR 314 Fundamentals of Nursing Research
NUR 541 Case Management in the Health Care of Families (3 credits) in lieu of NUR 332 Concepts of Family
NUR 520 Health Care Systems (3 credits) in lieu of NUR 408

Tuition and Fees
Students pay tuition and fee rates as published by the University. Students selecting the BS-MS option will pay undergraduate rates until they reach the level of completion of the baccalaureate degree.

NUR 105 three credits **S**
Human Nutrition
The principles of human nutrition. Main classifications of nutrients will be covered with emphasis on their role in health maintenance. Factors which affect the nutritional status of individuals, including stage in the life cycle, will also be introduced along with current nutritional problems in the U.S. This course is open to all students regardless of major. May fulfill elective credits for non-nursing majors.

NUR 204 two credits
Nursing as a Health Profession: Theoretical and Conceptual Basis of Practice.
The role of professional nursing in the health care delivery system. The historical, socioeconomic and political context of nursing will be discussed together with the theoretical basis and content of nursing practice

NUR 207 three credits
Womens' Health Issues
Women's health needs throughout the life stages. The course explores the significance of women's reproductive capacity, in a physiological, psychological, and social context and provides a framework for discussion of related issues. The course presents basic health information to assist students in promoting positive personal health. Cross-listed as WMS 207.

NUR 208 three credits
Survey of Complementary and Alternative Health Care
An exploration of alternative and complementary therapies used to prevent illness, maintain wellness, or alter disease progression. The philosophy, science, and art of the prevailing model of Western health care as well as complementary models of health care from other cultures are discussed. Roles of various health practitioners are explored. This course is open to all students regardless of major.

NUR 230 three credits
Holistic Health Promotion
An exploration of the role of genetic endowment, environment, and lifestyle behaviors in achieving optimal health for individuals. A life-span developmental approach is utilized in considering health practices intended to enhance health status and well-being for all age groups. Students will examine their own health status and develop a personal health promotion program.

Note: Theory portion meets one 50 minute session per credit; clinical/lab portion meets three 50 minute sessions per credit.

NUR 240/241 two credits theory/one credit laboratory
Health Assessment Through the Life Span
Corequisites: BIO 221, 223
Introduces the student to parameters of health for individuals representing various ages and stages across the life span. Communication skills are stressed in developing the nurse/client relationship. Emphasis is on the systematic assessment of healthy individuals as a first step in the nursing process.

NUR 290/291 three credits theory/three credits clinical
Nursing Care of Persons with Alterations in Optimal Level of Functioning
Prerequisites: NUR 204, 240, 241
Corequisite: NUR 303
This theory/clinical laboratory course focuses on application of the nursing process in support of the individual adult client with selected alterations affecting optimal level of function (nursing diagnoses). Emphasis is on the acquisition of basic skills for use in appropriate intervention with selected nursing diagnoses.

NUR 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see selection of catalogue on Other Learning Experiences.

NUR 302 three credits
Selected Mechanisms of Disease and Related Pharmacology
Prerequisites: RN status; BIO 221, 222, or ACT-PEP
Disease processes in humans. Content selected for study is chosen specifically to enhance the RN student's understanding of basic pathophysiologic concepts and is essential to understand the rationale for clinical judgment and therapeutic intervention in disease conditions. The ability of human beings to adapt to stressors is discussed throughout the course. Concepts of pharmacology and drug therapy are integrated to allow students to utilize this information in clinical practice.

NUR 303/304 three credits each term **S**
Selected Mechanisms of Disease and Related Pharmacology I, II
Prerequisites or Corequisites: BIO 221, 223, BIO 222, 224
Introduction to disease processes humans. Humans' responses and adaptation to injury and disease are discussed throughout. The content selected for study provides the rationale for clinical decision making and therapeutic interventions in disease conditions. Concepts of pharmacology are integrated throughout these courses.

NUR 306 four credits
Professional Nursing
Professional role development for RN students, addressing nursing issues through critical analysis of the historical influences, philosophical perspectives, and socioeconomic factors which impact professional role development. Emphasis will be on theoretical knowledge influencing client outcomes in various settings. Effective, creative communication skills leading to role transformation behaviors will be encouraged through the use of group process activities.

NUR 314 three credits
Fundamentals of Nursing Research
Prerequisite: Junior standing
Introduces the student to research as it relates to nursing practice and consequent improvement in health care. Content includes research design, methods of data collection and exploration of analytical procedures for interpretation of data. Emphasis is placed upon the use of clinical nursing research findings.

NUR 320/321 four credits theory/five credits clinical
Nursing Care of Hospitalized Adults
Prerequisite: Junior standing
Corequisites: NUR 304, 314
The application of the nursing process consistent with ANA Standards of Clinical Nursing Practice in support of adult clients experiencing multiple alterations in optimal level of functioning (OLF). Focus is placed on nursing interventions appropriate to clients with acute needs and multiple nursing diagnoses. Critical thinking, communication, and therapeutic nursing intervention skill development are emphasized.

NUR 322 three credits
Extended Assessment Skills for Nurses
Prerequisite: must have a current RN license
Provides registered nurses with instruction and practice in physical examination skills, obtaining a health history, and recognizing abnormal findings. This course or its equivalent is prerequisite to the graduate program.

NUR 332 three credits
Concepts of Family Care
Prerequisite: Junior standing or RN student
This course introduces the student to application of nursing process to the family. Students will draw from a variety of theories and conceptual frameworks to guide the gathering and interpretation of assessment data. Emphasis is placed on assessment and nursing interventions to support or strengthen optimal level of functioning (OLF) for families across the life cycle.

NUR 334/335 two credits theory/two credits clinical
Nursing Care of Beginning Families
Prerequisites: Junior standing and NUR 320, 321
Corequisites: NUR 332
This theory/clinical lab course focuses on the nursing care required by the childbearing and childrearing family as they adapt to developmental and situational stressors. The student applies the nursing process to the care of parents, children and families in collaboration with other members of the health team. Clinical experience occurs in a variety of community and institutional settings.

NUR 336/337 two credits theory/three credits clinical
Nursing Care of Children
Prerequisites: Junior standing and NUR 320, 321
Corequisite: NUR 332
This theory/clinical lab course focuses on the nursing care of children from infancy through adolescence and their families within a developmental framework, identifying ways to support the child's adaptation to developmental or situational stress. Emphasis is on the responses of children and their families to health maintenance measures, illness, injury and hospitalization.

NUR 408 two credits
Contemporary Issues in Nursing
Prerequisite: Senior standing
Expands the student's understanding of the way in which historical, socioeconomic, and political forces have influenced both the nursing profession and the nursing professional, and of ways in which an understanding of those forces can help nurses to shape the future of nursing. Emphasis is placed on the identification of strategies for confronting and dealing with issues in nursing.

NUR 420/421 three credits theory/three credits clinical
Psychiatric Mental Health Nursing

Prerequisites: Junior standing and NUR 320, 321
Theory/clinical lab course introducing the student to selected nursing and other theories of psychiatric and mental health nursing as the basis for application of nursing process to individuals with alterations in mental health. The goal of nursing with the client population is to promote optimal mental health of individuals and small groups within the context of the family and community. Emphasis will be on the evaluation of client outcomes attributable to care provided by nursing and other members of the health team.

NUR 430/431 three credits theory/three credits clinical
Community Nursing
Prerequisites: Junior standing, NUR 320, 321 (basic program); NUR 306 (RN program)
Corequisite: NUR 332
Theory/clinical lab course introducing the student to the community and aggregate populations as the client, and examining the role of the community health nurse as a facilitator of change in communities and populations. Principles of epidemiology, demography, environmental sciences and political organizations are synthesized with nursing concepts and principles to provide the basis for community nursing practice. Using the community process, stressors on and adaptations of communities and aggregates within communities are assessed, and theory based nursing care plans for populations are developed. Emphasis will be placed on implementation and evaluation of interventions designed to promote health of populations at risk by maximizing the population's self care potential.

NUR 440/441 two credits theory/one credit clinical
Nursing Management in the Long-Term Care System
Prerequisites: Senior standing (basic program); NUR 306 (RN)
Corequisites: NUR 450, 451 (basic program); none (RN)
The clinical management role of the professional nurse in the nursing care of older adults. Nursing practice occurs in skilled nursing facilities and other settings that provide students with the opportunity for clinical decision making, health promotion, health teaching, and referral within the long-term care system. Long-term care system regulatory processes, public policy, legal and ethical issues, and socioeconomic and cultural variables will be considered as they affect client outcomes. Cross-listed as GRT 440/441.

NUR 450/451 three credits theory/four credits clinical
Nursing Management in Acute Care
Prerequisites: Senior standing
Theoretical concepts, research, and intervention strategies essential to the nursing management of the acutely ill client, and consistent with the ANA Standards of Clinical Nursing Practice. Students are provided with opportunities to demonstrate synthesis of their learning in a variety of practice settings. Socio-environmental factors which influence client and nurse health care decisions are analyzed. Opportunities to apply principles of leadership/management in practice are provided. The collaborator, advocate, and leadership roles of the nurse are stressed. Critical thinking, communication, and therapeutic nursing intervention skills in nursing practice are refined. Clinical settings include acute care hospitals, and clients' homes.

NUR 452/453 three credits theory/ three credits clinical
Nursing Management Across the Continuum of Care
Prerequisites: NUR 306, NUR 322
The nursing management of adults experiencing chronic health problems with complex responses. Emphasis is placed on the assessment of the functional health status of middle and older adults and families in multiple care settings. This theory/clinical course is designed to provide students with knowledge from bio-psychosocial sciences, nursing theory and research, and philosophy that supports a multidimensional perspective on the experience of chronicity. Selected concepts of chronicity such as quality of life, altered mobility, sexuality, body image, stigma, social isolation, compliance and chronic pain are applied in clinical experiences with clients across the continuum of care. Nursing models are used to guide implementation of the nursing process for adults of various developmental stages.

NUR 481/581 three credits
Women's Health Seminar
Prerequisites: Seniors must have minimum GPA of 3.2
Research into the causes, treatments, and prevention of health problems that affect the quality of life of adult women in the United States. Material from the NIH, Office of Research on Women's Health, and other relevant studies will be reviewed using electronic and other data sources. Issues that pertain to women's health will be addressed as related to diseases, disorders, and conditions that are unique to, more prevalent among, or far more serious for women than for men. Factors such as biological processes, lifestyle, racial, ethnic, age, and socioeconomic variables will be studied

NUR 485/585 three credits **S**
Environmental Health
Prerequisite: Introductory Chemistry or Biology or permission of the instructor
The interaction of the environment and human health, from the perspective of an ecological framework. Physical, psychological, and psychosocial health responses to environmental toxins and infectious agents will be a central theme. Previous endeavors to maintain and improve the environment through the legislative process, public policy and regulation will be studied by examining case studies. The effects of war on the environment and public health will also be studied. (Only the 485 level carries general Education credit.)

NUR 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

Graduate Courses in Nursing

NUR 500 three credits
Theory Building in Nursing
Examination of (a) components of theories, various activities of theory development and theoretical/conceptual analysis, and (b) the evolution and status of theory development in nursing. Particular emphasis will be placed on the relationship of theory-research-practice in nursing knowledge development.

NUR 503 three credits
Transition to Advanced Practice Nursing
Portfolio students only
Designed for nurses with bachelor's degrees in areas other than nursing, provides a common knowledge base including the community perspective as a foundation for graduate study in nursing. The realities of modern nursing practice are examined

NUR 511 three credits

Note: Some graduate courses may be open to undergraduates. Please consult your department chairperson. See the *Graduate Catalogue* for graduate general and program requirements.

Research Methodology in Nursing
Assists students in identifying and exploring researchable problems in nursing. Components of the research process are examined. Both quantitative and qualitative approaches to generating and testing nursing knowledge and the associated philosophies of each approach are examined. The focus of the course is on (a) understanding and judging the usefulness of scientific information for clinical nursing practice, (b) valuing research as a basis for professional nursing, and (c) collaborating in research activities.

NUR 515 three credits
Managing Organizational Resources
The use of financial and human resources to fulfill the function of nursing in a health agency. Coalition building, negotiation, and conflict resolution skills will be developed to facilitate roles in the bureaucratic environment. Alternate approaches to leadership styles, management skills, utilization of personnel, interpersonal negotiations, budget management and the nurse leader in the organizational structure will be explored.

NUR 520 three credits
Health Care Systems
The nature of the health care system. The focus will be on the history, development, financing, and regulation of the health care system. Selected mechanisms for change such as policy formation, cost analysis, rationing, accreditation, and quality assurance programs will be examined.

NUR 540 three credits
Biostatistics and Epidemiology
The basic principles and methods of biostatistics and epidemiology and their applicability in the field of public health nursing. Student will learn the basic skills needed to interpret the literature relevant to public health practitioners.

NUR 541 two credits theory;
one credit practicum (3 clock hours)
Case Management in the Health Care of Families
Analyzing theories of family development and interaction to develop a conceptual base for assessment of family health needs. Students will be expected to develop/or critically examine the defining characteristics of a family-based nursing diagnosis. Emphasis will be placed on nursing interventions for families in crises due to family dysfunction or the occurrence of HIV infection, chronic illness, or social pathology. Case management as a strategy for meeting family health needs will be utilized in a clinical setting.

NUR 542 three credits
Seminar in Nursing Education
Identifying and exploring current problems in nursing education. This seminar focuses on (a) understanding the conceptual issues in nursing education, (b) evaluating the usefulness of various approaches in nursing education, (c) valuing multiple approaches and styles both in teaching and learning, and (d) developing skills in nursing education.

NUR 543 three credits
Topics in Ethics and Distributive Justice
Prerequisite: Permission of instructor
Current ethical issues in health care embedded in theoretical frameworks of distributive justice, ethics, and feminism. Students from various advanced practice arenas of human services including nursing, philosophy, political science, criminal justice, and the social sciences debate and analyze specific ethical issues inherent in their advanced practice. A multidisciplinary approach provides the student with a comprehensive perspective for analyzing ethical issues.

NUR 549 three credits
Community Building and Planning for School Health
Special elective for off-campus program; not for UMass Dartmouth degree program
Theories of coalition building and methods of program planning to develop health care programs for school populations. The emphasis will be on planning, organizing, and obtaining resources for school health programs to promote health. The legislative and regulatory branches of the government will be examined closely to understand their part in defining problems, regulating, and evaluating health programs within local and regional school systems.

NUR 550 three credits
Pathophysiological Bases for Advanced Nursing Practice
The interrelationship of human systems and the effect of illness on the individual as a whole. Students examine prototypic concepts and patterns related to clinical physiology using current texts and research literature. The pathophysiology of various body processes such as oxygenation, perfusion, digestion, elimination and defense are considered. The dynamics of stress, ischemia, edema, and pain are presented. Students analyze physiological problems in-depth as they relate to specific clients.

NUR 551 two credits theory
Scope and Outcomes in Advanced Health Nursing
Prerequisite: NUR 500
The scope, standards, and outcomes of advanced practice nursing. The evolution of advanced practice is considered by examining historical background, current realities, and future directions. Students analyze the role components of expert clinician, educator, consultant, and case manager in the care of adult clients. Standards of practice, development and use of protocols/practice guidelines, and evidence of improved health outcomes are analyzed as mechanisms to promote delivering quality care. Critical thinking, written and oral communication, and therapeutic nursing intervention skill development are emphasized.

NUR 552 one credit theory,
two credits lab/practicum (6 clock hours)
Advanced Assessment for Primary Care
Establishing a foundation for assessment in primary care through didactic, laboratory modules, and practicum experiences. Emphasis is on health history interviewing, basic physical examination using four modalities, and beginning skill development in differential diagnosis. The course is restricted to adults including emphasis on gender, racially diverse and aging populations.

NUR 553 three credits
Clinical Pharmacology for Ambulatory Care
Prerequisite: NUR 550
Pharmacological agents used in the prevention, diagnosis, and treatment of human disease and injury in the adult. The focus is on the basis for the clinical use of drug therapy. Characterization, evaluation and comparison of drugs form the framework for this course. Classes of drugs will be critically evaluated in terms of desired effects and degree of tolerable undesired effects. Clinical pharmacological concerns related to aging, drug interactions, and legalities will be addressed.

NUR 556 two credit theory,
three credits practicum (9 clock hours)
Introduction to Primary Care
Prerequisites: NUR 550, NUR 552, NUR 553
Nursing care of the adult client who is experiencing acute episodic illness in a community setting. The content reflects knowledge necessary for providing primary care services in an ever-changing, ever-evolving health care climate. It will build on the student's knowledge of physical assessment, pathophysiology, pharmacology, and other treatment modalities,

emphasizing knowledge and skill of health promotion, screening, maintenance, diagnosis, differential diagnosis, and management of care in collaboration with other health professionals. Nursing care and treatment modalities will be stressed for each patient. Clinical experiences will be with preceptors in a variety of settings.

NUR 595 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, graduate director, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

NUR 596 variable credit
Directed Study
Prerequisites: Permission of the instructor, graduate director, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

NUR 610 one credit
Capstone/Thesis Direction
The student works with the major advisor to develop a purpose for either a capstone or a thesis. The completed study will be submitted as a major scholarly product. The report must be acceptable and will be graded P/F; it will not carry a letter grade.

NUR 635 two credits
Clinical Reasoning in Advanced Nursing Practice
Pre- or corequisite: Clinical course in selected option
Current theoretical and empirical knowledge relative to critical thinking and clinical decision making. Research guided by decision theory, information processing theory and prospect theory will be considered. Several informatic approaches such as expert systems and decision analysis will be examined. Ethical considerations will be explored. Strategies to improve diagnostic reasoning will be discussed and students will analyze their own clinical judgments throughout the course.

NUR 647 three credits
Social Pathologies/The New Morbidities
The prevalence and severity of public health problems or social morbidities. Survey instruments that assess high risk health behaviors in selected populations are examined. Public health strategies designed to reduce the new social morbidities are reviewed.

NUR 654 two credits theory, three credits practicum (9 clock hours)
Advanced Nursing Management of Illness-Related Phenomena
Prerequisites: NUR 658 (NP track only)
Negotiated management of illness-related phenomena occurring along a continuum. Relevant theoretical foundations, expanded clinical knowledge, and complex nursing interventions are explored and further synthesizes into client-based theories and measurable outcome criteria. The practicum focuses on the application of theoretical knowledge and clinical skills within the selected clinical focus. Emphasis is placed on issues related to continuum of care.

NUR 658 two credits theory, four credits practicum (12 clock hours)
Role Synthesis: Adult Nurse Practitioner
Prerequisite: NUR 556
The historical, socio-economic, political, and professional constraints and opportunities influencing the nurse practitioner role. Leadership strategies that support the development and negotiation of this role in the health care system are explored. Policies related to legal aspects of the role are analyzed. Transition to the role is enhanced by further examination of decision-making in primary and continuing care in both the theoretical and practicum component.

NUR 675 three credits
Seminar in Advanced Practice
Individualized clinical assignments and focused seminar discussions to foster the synthesis of advanced knowledge and skills in the development of the advanced practice role. Precepted clinical experiences will be expanded through the exploration of innovative models of advanced practice, research, utilization strategies relating to identified concerns for a specific client population or environment of care, and emphasis on client population or environment of care, and emphasis on client and system outcome measures.

NUR 680 three credits
Community Health Assessment
Providing knowledge and skills to develop the role of the community/public health nursing specialist. The course presents throughout the core public health functions of assessment, assurance, and policy development, focusing on assessment. Each student will assess a community, identifying the strengths, weaknesses, stressors, and adaptations of aggregates and communities. Principles of epidemiology, demography, environmental sciences, and political theory will be synthesized with nursing concepts to provide the basis for community nursing practice in a dynamic health delivery system.

NUR 681 three credits
Community Health Nursing II
Prerequisites: NUR 541 and 599
Study of methods of health planning through development of program plans that address identified health care problems in the region, with special emphasis on needs of the underserved, cultural variations in health practices, and cost effectiveness. The course explores theories of community organization, coalition development, and of health program generation that incorporate latest research findings. Evaluation plans will be developed to measure outcomes. Legislative, executive, and regulatory branches of government will be examined to understand their roles in assessing problems, planning, implementing, and evaluating health programs; funding sources for programs will also be explored.

NUR 682 three credits practicum (9 clock hours)
Community Health Nursing II Practicum
Pre- or corequisites: NUR 680 and 681
The student will utilize principles of social change, community organization, planning, and evaluation to develop effective community nursing programs. Working within a community framework, the student will develop a community project as an intervention for a previously identified community health problem.

NUR 683 three credits
Community Health Nursing III
Prerequisite: NUR 682
Effective advanced practice in community health nursing, through a theoretical basis to support the role of community health nursing in program evaluation and quality management. The student will analyze critically existing taxonomies and databases to determine their effectiveness for measuring outcomes. Students will gain evaluation research skills through analysis of existing nursing programs and will refine those skills by identifying variables that have the potential to improve the effectiveness of community health nursing programs.

NUR 684 three credits practicum (9 clock hours)
Community Health Nursing III Practicum
Corequisite: NUR 683
Application of evaluation skills to enhance

the role of quality management in public health/community health nursing. The major focus will be on measurement of outcomes, quality management, and cost effectiveness. The students will identify and evaluate a community program, identify critical variables, and create or analyze a database to promote measurement of qualify and effectiveness. The practicum utilizes computer skills throughout.

NUR 701 three credits
Systematizing, Translating, and Transitioning Knowledge to Nursing Practice
Synthesis, transfer, and application of knowledge in practice. During this course doctoral students study how practice knowledge is structured and explore metacognitive strategies to promote accurate knowledge use. In-depth analysis of theories of knowledge use will be examined. Students will examine structured models, construct new models, and attempt to resolve inconsistencies in existing designs to make practice knowledge explicit. The role of reflective knowledge generation will be scrutinized. Issues of common language, including taxonomy systems recognized by the ANA, emerge as significant features in practice knowledge development. Knowledge assimilation, codification strategies, synthesis, concept mapping, and clustering become important tools for the knowledge developer. Informatics and the use of decision support systems as well as issues of soft knowledge such as intuition will be considered.

College of Visual and Performing Arts

CVPA, the College of Visual and Performing Arts, is a comprehensive arts college with Bachelor's and Master's programs that prepare students for careers in the arts. To assure that its programs meet appropriate standards, the University of Massachusetts Dartmouth is an accredited institutional member of the National Association of Schools of Art and Design, the national accrediting body for the visual arts.

Undergraduate students in the college may choose concentrations from a broad spectrum of the arts, all of which provide a framework for developing a high degree of professional competence and pursuing individual creative goals. Essential to this framework are the academic programs and resources of the whole university.

Students of Visual Design may select *Graphic Design, Illustration, Photography, Electronic Imaging, Ceramics,* or *Jewelry/Metals* and receive a Bachelor of Fine Arts in Visual Design. Alternatively, students may pursue Bachelor of Fine Arts degrees in *Art Education, Painting/2D Studies, Sculpture/3D Studies,* or *Textile Design/Fiber Arts*. Students may also pursue a Bachelor of Arts degree in *Art History* or in *Music*.

The facilities and equipment on the Dartmouth and New Bedford campuses are a source of pride for our students and faculty, and are among the finest in New England. Visits by applicants are encouraged.

Individual attention is also emphasized. Students are encouraged to consult with the Foundation advisors, departmental advisers, the Chairpersons, and the Dean about choosing programs and options and on matters concerning their progress at the university.

Admission to the Undergraduate Major Programs in Studio Art

All applicants for admission submit an art portfolio. This requirement is summarized below. Specific instructions are given in the *Admissions Bulletin*.

New freshman applicants are encouraged to seek admission to the college's studio art programs as "Studio Art Unspecified" majors. During the Foundation Year they will have an opportunity to select specific areas of specialization in consultation with an advisor.

Transfer students are admitted into specific majors only. They will present an art portfolio as an element in the department's admission decision and to aid in the evaluation of their previous work for transfer credit at UMass Dartmouth. They will also be asked to identify a preferred option, such as "Graphic Design" or "Ceramics," if their major of choice offers options. Transfer students who wish to be admitted into courses above the sophomore level must bring a portfolio to transfer orientation. Acceptance into advanced courses is rare, not automatic.

Art Portfolio
Submission of a portfolio is required. In order to understand an applicant's ability and preparation, faculty members will review a portfolio. We recognize that a portfolio is not a precise measure of potential and that our applicants come to us with varying amounts of previous art instruction. Space in the art programs is limited; it is strongly recommended that you submit your application together with your portfolio before March 15.

A portfolio should consist of fifteen 35mm slides presented in an 8 1/2" by 11" plastic file sheet. The faculty is especially interested in seeing drawing from direct observation. Slides should have labels with the applicant's name and the size, medium, and date of completion of the work; a dot in the lower left hand corner; and numbers. The numbers should correspond to a list which includes information that will be useful in understanding the work (e.g., descriptions of the assignments, concepts, or processes). Please enclose a stamped envelope with enough postage so that we may return your portfolio.

Music Audition
An audition is required of applicants to the music program. The Department of Music and the Office of Admissions will arrange a convenient time with applicants.

Changing to a Studio Art major
Students requesting a change of major into one of the studio arts majors/options are expected to provide a portfolio of slides along with the change of major form.

Advanced Placement
Credit for advanced placement courses will be awarded if grades of 3 or above (on a 1-5 scale) have been achieved in courses which have UMass Dartmouth equivalents. The department will determine whether this credit will be given toward elective or major requirements.

Course Prerequisites
Many programs in the College of Visual and Performing Arts are sequential, building knowledge and skills step-by-step. Course prerequisites, which assure that essential knowledge has been achieved, are identified in the course descriptions found in this catalogue. Normally, courses are offered only once each year; therefore, students entering the college at mid-year should be aware that they may have to wait until the following semester to meet a prerequisite.

Studio Credit/Class Hour Requirements
Studio art courses require three hours of work per week for each hour of credit. In most studio art courses, two hours per credit a week are scheduled in class, and the third hour is the individual student's responsibility to complete.

Cumulative Average
To be eligible to graduate, a student must achieve at least a 2.0 cumulative average (C) for the entire program with a minimum of 2.0 in identified key courses in the major field of study, as identified in subsequent sections of the catalogue.

Retention of Student Work
The College of Visual and Performing Arts reserves the right to retain examples of student class work for teaching and exhibition purposes.

Accreditation

The University of Massachusetts Dartmouth is an accredited institutional member of the National Association of Schools of Art and Design.

Graduate Programs

The college offers graduate programs leading to the Master of Fine Arts in Artisanry, the Master of Fine Arts in Fine Arts, the Master of Fine Arts in Visual Design, and the Master of Art Education. The MFAs in Artisanry, Fine Arts, and Visual Design are professionally oriented and develop the abilities and interests of each student toward the broad goal of advanced professional practice. The Master's in Art Education has components for in-service art teachers, fine arts degree holders, and continuing education students. See the *Graduate Catalogue* for information.

Foundation Studio Arts Program

Required of All Majors (except Art History and Music)

The foundation studio arts program at the College of Visual and Performing arts is a rigorous program designed to promote creativity and develop in the young artist an understanding of the visual language. Emphasis is placed on developing drawing skills through organic and inorganic subject matter, refining abilities in working with two- and three-dimensional design problems, and identifying professional interests. The foundation courses (at the 100 level) are required for all visual arts majors and are a prerequisite for all 200- or higher-level courses in Fine Arts, Textile Design/Fiber Arts, Visual Design, and Art Education. Two Art History courses, ARH 125 Studies in Visual Culture: Renaissance to Modern Art and ARH 150 Studies in Visual Culture: Modern to Contemporary Art, are also required, and together with ARH 200 Studies in Visual Culture: Ancient, Medieval, and World Art (scheduled for the second year), they provide a historical survey of the art of the Western world.

All studios meet two hours weekly for each credit offered.

Foundation Studio Arts Program, *cont.*

Foundation Courses

FOU 101 one credit **C**
Visual Arts Colloquium I
1.25 lecture hours
A forum for faculty and visual artists to present current topics in the arts to new visual art students. It serves as an introduction to the resources of the College of Visual and Performing Arts and the University. In addition, the Colloquium hosts cultural events, providing opportunities for community activities for the CVPA.

FOU 102 one credit **C**
Visual Arts Colloquium II
1.25 lecture hours
Continuation of FOU 101.

FOU 110 three credits **C**
Foundation: Structural Drawing
One of two studio courses that introduce students to the comprehensive visual language of drawing. Various projects and presentations expose students to numerous drawing approaches, including ways of structuring the picture plane, establishing proportion, creating believable space with linear perspective, and modeling form with shading. Students will apply these skills to idea generation, form development, experimental variations on a design, investigative studies of creative problem solving, and expressions of movement and spatial illusion. Students are also introduced to the processes involved in planning, researching, and actualizing a major drawing project. Critiques and lectures will help students develop an understanding of the critical issues of drawing and of its context within the history of art.

FOU 112 three credits **C**
Foundation Life Drawing
Studio course that introduces students to fundamental drawing principles. The advancement of observational skills is the primary concern, as it plays a major role in preparing students for subsequent study in the visual arts. Assignments develop abilities in the two-dimensional representation of form and space. In addition, students are introduced to the historical spectrum of drawing through lectures and demonstrations. Through intensive study of the figure, students are provided with a basis for artistic and cultural tradition. The human form, the most enduring theme of western art, has been used by artists throughout history to express their interpretations of the world.

FOU 114 two credits **C**
2D Workshop
To develop a critical understanding of basic two dimensional design, students explore the processes of idea generation, research, and organization of fundamental visual principles. Comprehension is facilitated by direct implementation in a single medium. Students pursue the development of visual principles in one of the following studio areas: painting, photography, printmaking, illustration, or textile design. The studio dynamics allow for intense interactions with faculty and fellow students, as well as the enhancement of critical and creative problem solving. Emphasis is placed on constructive critical analysis, visual perception, and the relationship between sensory and reasoning activities.

FOU 115 two credits **C**
Visual Language
Studio course that explores two dimensional form at a fundamental level. Assignments develop skills in composition, color theory, figure and ground, proportion, contrast and scale. In addition, attention to craftsmanship in various media, such as drawing, painting, photography and collage, develop patience, concentration, and the necessary work ethic for all forms of visual communication. A fundamental goal for this course is to investigate the communicative power of art. Lectures and presentations, coordinated with other disciplines such as Art History and English, develop students' critical awareness of visual arts' potential to inform and influence its audiences.

FOU 124 two credits **C**
3D Concepts
Studio course that promotes the discovery and understanding of the third dimension through the manipulation of materials. Students develop creative problem solving abilities by conducting research, generating ideas, developing working drawings and plans, and constructing three dimensional objects. This course advances visual sensitivity, accurate analysis of process, and a basic proficiency in the processes of carving, modeling, casting, and assemblage.

FOU 125 two credits **C**
3D Workshop
Studio course that utilizes the tactile, physical and visual richness of three dimensional discipline areas to explore object making and related processes. Students will explore basic design in one of the following studio areas: ceramics, metals, sculpture or wood. The limited class sizes provide significant contact between faculty and students, and the inclusion in a studio community provides exposure to creative problem solving techniques and innovations used by advanced students. This course strives to help students develop an awareness of what is meaningful and of personal interest to them, promoting idea generation and self confidence

ARH 125 three credits **C, G**
Studies in Visual Culture: Renaissance to Modern Art
3 lecture hours
Surveys painting, sculpture, and architecture from the Renaissance to Impressionism

ARH 150 three credits **C, G**
Studies in Visual Culture: Modern to Contemporary Art
3 lecture hours
Surveys developments in painting and sculpture from the late 19th century to World War II. The historical context of major artists and the theoretical, critical and aesthetic issues surrounding their works will be discussed.

ARH 200 three credits **C, G, W**
Studies in Visual Culture: Ancient, Medieval, and World Art
3 lecture hours
Prerequisites: ARH 125, 150; or permission of instructor
Explores the critical relationships between art/architecture and its social, political, and economic contexts. The course presents the art object as a cultural artifact which expresses specific values of the time and space in which created. The course thus transcends identification and chronology of objects of art, to ask: Why was a work of art made? Students will attain an intellectual and visual understanding of significant themes and issues of Ancient, Medieval, and World Art; will think and write critically about social, economic, political, and/or religious structures that influence and formulate visual art traditions; and will gain in-depth knowledge on a specific artist, art period, or theoretical problem through an extended research project.

Certificate in Artisanry

The Certificate in Artisanry is a 36 credit credential awarded by the College of Visual and Performing Arts, UMass Dartmouth, upon completion of study centered on the development of skills and concepts in the craft areas. Participating programs in Artisanry include Textile Design/Fiber Arts, Jewelry/Metals, Ceramics, and Wood/ Furniture Design.

It is expected that students who complete the Certificate Program will have gained mastery of specific technical skills in one or more craft areas, knowledge of current trends and various historical precedents of that media area, and a direction for future work, and acquaintance with the professional paths available to them.

Up to 18 credits may be met through transfer of prior educational experience, which can include credits from an accredited institution of higher learning or experience gained in workshop(s) that awarded no formal credit, e.g., Haystack, Arrowmont, Penland, or centers of learning in foreign countries.

At least 18 credits, including part of the introductory studio requirement, all intermediate and advanced level studio requirements in the student's chosen field, and the adjunct Artisanry studio course requirement must be taken in residence at UMass Dartmouth.

Certificate students are integrated into regularly scheduled undergraduate classes. They are expected to perform on a similar technical and aesthetic level, and must be willing to work within the established curriculum and semester schedule of class meetings, projects, field trips, critiques, and student exhibitions. Certificate course requirements may be completed on a full-time or part-time schedule.

Student Profile
The Certificate student will enroll in a series of studio and academic courses to develop appropriate technical skills and a personal aesthetic for sustained professional work. Certificate students work alongside BFA and sometimes MFA degree students and are expected to perform on similar technical and creative levels. This program is designed to include the following students:

- second degree art/design students wishing to pursue experience in one or more craft areas as an adjunct to their prior arts education,
- art/design professionals wanting to retrain, augment, or update their skills and creative directions,
- second career students with personally gained skills in the crafts but little or no previous formal arts education,
- those for whom the existing degrees offered by the University are not deemed necessary or feasible.

Application Procedure
Persons interested in applying to the Artisanry Certificate program write to the Dean of the College of Visual and Performing Arts requesting admission to the program. Applicants should

- indicate which subject they wish to pursue and their goals in pursuing the Certificate,
- enclose transcripts of all undergraduate work completed and records of related non-credit experience at recognized national workshops,
- enclose at least 10 slides of their art work, and
- enclose a self-addressed, stamped envelope if they wish their slides to be returned by mail.

The Dean's Office will forward applications to the faculty in the appropriate subject areas for their recommendation. Faculty may request an interview with the applicant. Recommendations are due to the Dean within two weeks of receipt of the applicant's materials.

Paying careful attention to the recommendation of the faculty, the Dean of the college will decide whether to admit the applicant to the program. The Dean will notify the applicant of the decision. The Dean will send the files of admitted students to the Office of University Records for a non-degree student file to be created. Because Certificate students are placed in regularly scheduled classes, admission to a specific area will also be based on the availability of space.

If an applicant is judged to be insufficiently prepared in technical areas or lacks clear focus but is judged to have potential for learning and personal growth, the applicant may be asked to enroll in one or more courses as a non-certificate special student prior to making formal application to the Certificate Program.

Registration for Certificate students will take place after the close of the registration period for degree students.

Course and Credit Requirements
Students in the Artisanry Certificate Program are required to take the following sequence of courses. If proof of prior credits earned is provided through transcripts, several courses and credits may be waived at the discretion of the faculty. Courses for which transfer credit is allowed are noted below.

Courses	*Credits*
Intro. Studio (e.g., Ceramics 1, 2) 3 transfer credits allowed, e.g., Ceramics 1	6
Interm. Studio (e.g., Ceramics 3, 4)	6
Adv. Studio (e.g., Ceramics 5, 6)	3
Adjunct Artisanry Studio Elective (e.g., Weaving 1)	3
Drawing, Foundation Design, or Color Studio 3 transfer credits allowed	3
Art History Electives 6 transfer credits allowed	6
English Lit. or Composition Electives 6 transfer credits allowed	6
Total for Certificate in Artisanry	36

Certificate in Fine Arts

The Certificate in Fine Arts is a 36 credit credential awarded by the College of Visual and Performing Arts at UMass Dartmouth. This interdisciplinary program centers on development of skills and concepts in the areas of Drawing, Painting, Printmaking, and Sculpture.

It is expected that students who complete the Certificate Program will have gained mastery of certain specific technical skills in one or more areas, an awareness of current trends and various historical precedents of that media area, and an understanding of their own focus and the professional paths available to them.

A maximum of 15 of the credit requirements can be met through transfer of prior educational experience, which can include advanced prior learning at a recognized institution or workshop venue where no formal university credit was available, i.e., Haystack, Arrowmont, Penland, Vermont Studio School, Skowhegan, or a center of learning in foreign countries.

At least 18 credits, including part of the introductory studio requirement, all intermediate and advanced level studio requirements in the student's chosen field, and the adjunct Fine Arts studio course requirement must be taken in residence at UMass Dartmouth.

Certificate students will be integrated into regularly scheduled undergraduate classes. They will be expected to perform on a similar technical and aesthetic level, and must be willing to work within the established curriculum and semester schedule of class meetings, projects, field trips, critiques, and student exhibitions. Certificate course requirements may be completed on a full-time or a part-time schedule.

Student Profile
The certificate student will enroll in a series of studio and academic courses to develop appropriate technical skills and a personal aesthetic for sustained professional work. Certificate Program students work alongside BFA degree students and are expected to perform on similar technical and creative levels. The program is designed to include the following students:

- second degree art/design students wishing to pursue experience in one or more areas of the Fine Arts as an adjunct to their prior arts education,
- art/design professionals wanting to retrain, augment, or update their skills and creative directions,
- second career students with personally gained skills in Fine Arts but little or no previous formal arts education,
- those for whom the existing degrees offered by the University are not deemed necessary or feasible,
- art educators who wish to return to a learning environment and develop their skills in the Fine Arts.

Application Procedure
Persons interested in applying to the Fine Arts Certificate program write to the Dean of the College of Visual and Performing Arts requesting admission to the program. Applicants should

- indicate which subject they wish to pursue and their goals in pursuing the Certificate,
- enclose transcripts of all undergraduate work completed and records of related non-credit experience at recognized national workshops,
- enclose at least 10 slides of their art work, and
- enclose a self-addressed, stamped envelope if they wish their slides to be returned by mail.

The Dean's Office will forward applications to the faculty in the appropriate subject areas for their recommendation. Faculty may request an interview with the applicant. Recommendations are due to the Dean within two weeks of receipt of the applicant's materials.

Paying careful attention to the recommendation of the faculty, the Dean of the college will decide whether to admit the applicant to the program. The Dean will notify the applicant of the decision. The Dean will send the files of admitted students to the Office of University Records for a non-degree student file to be created. Because Certificate students are placed in regularly scheduled classes, admission to a specific area will also be based on the availability of space.

If an applicant is judged to be insufficiently prepared in technical areas or lacks clear focus but is judged to have potential for learning and personal growth, the applicant may be asked to enroll in one or more courses as a non-certificate special student prior to making formal application to the Certificate Program.

Registration for Certificate students will take place after the close of the registration period for degree students.

Course and Credit Requirements
Students in the Fine Arts Certificate Program will be required to take the following sequence of courses. If proof of prior credits earned is provided through transcripts, several courses and credits can be waived at the discretion of the faculty Courses for which transfer credit is allowed are noted below.

Courses	*Credits*
Introductory Studio (200-level course in chosen area) 3 transfer credits allowed, e.g., Sculpture 1 or Painting 1	6
Intermediate Studio (300-level course in chosen area)	6
Advanced Studio (400-level course in chosen area)	6
Drawing, 300 level. Students who have made drawing their chosen area will take 6 credits in another area, e.g., Painting, Printmaking 3 transfer credits allowed	6
Art History Electives 6 transfer credits allowed	6
English Lit. or Composition Electives 6 transfer credits allowed	6
Total for Certificate in Fine Arts	36

Art Education

The Art Education program provides a sequence of practical, theoretical and studio-based experiences leading to proficiency in the teaching of art. The scope of the program permits the student to work in public or private school systems or in other private and public agencies. The program emphasizes both supervised field work in surrounding communities and university courses in the theory and practice of art and education.

Teaching licensure in art education is the goal of most art education majors. Students wishing licensure should consult with the department chairperson. Teaching licensure may also be earned by students who already possess the bachelor's degree and are interested in earning an MAE degree.

Faculty and Fields of Interest

Virginia K. Freyermuth art education, painting, art advocacy, family involvement, interdisciplinary studies

Kathy A. Miraglia art education, especially elementary; adult professional development; research; painting, drawing, interdisciplinary curriculum

Arlene B. Mollo (chairperson) art education, public policy, research, interdisciplinary curriculum, museum education, painting and design

Art Education Major BFA degree

Various choices are presented in the curriculum shown here, and further substitutions are possible with the approval of the Art Education chairperson. Art Education students complete a concentration in one of the studio areas in the College of Visual and Performing Arts. The studio concentration may be in Painting, Graphic Design, or Textile Design. Upon consultation with the Art Education chairperson, a program of studio electives can be designed in other areas, such as Crafts, Art History, Sculpture, or 2-D work.

Students aiming for teaching licensure must choose to pursue either the elementary (N-9) or the secondary (5-12) level. Teaching licensure students become Art Education Teacher Candidates after passing the Communication and Literacy Skills portion of the Massachusetts Test of Educator Licensure (MTEL). Teaching licensure students become Art Education Pre-Service Candidates only after passing the entire MTEL—a prerequisite for entrance to the student teaching practicum. The appropriate Art Education courses must be selected depending upon the level of licensure sought, in consultation with the Art Education chairperson, prior to class registration each semester. A positive recommendation by the chairperson permits the student to do his/her student teaching (Practicum).

Program requirements will be revised to reflect on-going developments in state regulations and educational reform.

Students aiming for careers other than teaching may also pursue this major, and these students are not held to a requirement to pass the MTEL. These students take an alternative Practicum that provides a field experience placement in a community setting, agency, hospital, nursing home or geriatric center, museum, children's day care facility, or the like in lieu of a student teaching placement in a school.

During their sophomore year all majors must meet with the Art Education chairperson to declare their career intentions and plan their studies accordingly. Majors must choose their Studio Concentration area by the spring advising period of their sophomore year.

Requirements

		Semester Credits First	Second
First year			
FOU 101, 102	Visual Arts Colloquium	1	1
FOU 110, 112	Foundation: Structural/Life Drawing	3	3
FOU 114, 115	2D Workshop/Visual Language	2	2
FOU 124, 125	3D Concepts/3D Workshops I	2	2
ARH 125	Visual Culture: Renaissance to Modern Art	3	
ARH 150	Visual Culture: Modern to Contemporary Art		3
ENL 101, 102	Critical Writing and Reading I, II	3	3
PSY 101	General Psychology	3	
PSY 102	Child Psychology		3
		17	**17**
Second Year			
AED 200	Observational Strategies in Artistic Dev.	3	
AED 215	Special Needs: Current Issues		3
ARH 200	Visual Culture: Ancient, Medieval, World Art	3	
	Art History Elective		3
FIA 221, 222	Figure Drawing I, II	3	3
	Art Ed Elective	3	
	CVPA Studio Concentration**	3	3
	General Education Elective*		3
	Literature Electives***	3	3
		18	**18**
Third Year			
AED 300	Methods and Materials	3	
AED 310	Curriculum Design		3
	CVPA Electives	3	6
	CVPA Studio Concentration**	3	3
	Natural Science/Technology Electives	3	3
	Mathematics Elective	3	
		15	**15**
Fourth Year			
AED 405	Social Philosophy and History of Art Education	3	
	CVPA Electives	6	
	CVPA Studio Concentration**	3	
	Humanities Electives***	3	
	General Education Elective*		3
AED 411	Practicum/Seminar: Elementary N-9 **or**		
AED 412	Practicum/Seminar: Secondary 5-12		12
		15	**15**
	Total credits:		**130**

* Students must select electives in such a way as also to satisfy their general education requirements in diversity and ethics.

** The Studio Concentration requirement consists of 15 credits of sequential study (sophomore, junior, and senior year studio courses) in one of the major studio areas of the College of Visual and Performing Arts.

*** In Art Education, Humanities electives include Art History, English, Foreign Language, Literature, History, Music, and Philosophy courses. Students must select electives in such a way as also to satisfy their general education requirements in diversity and ethics.

Post-Baccalaureate Art Teacher Licensure

Those who already possess a bachelor's degree and wish to return to school to receive art teacher licensure may apply for acceptance to the teacher licensure program through the MAE degree. Those who are in another bachelor's degree program and are considering art teacher licensure should transfer into Art Education beginning with the sophomore year and select a level of certification grades N-9 (Elementary) or 5-12 (Secondary).

This post-baccalaureate program has the approval of the Bureau of Teacher Certification, Massachusetts Department of Education, to lead to a single level initial license in Massachusetts as an art teacher in grades Pre K-9 or 5-12. As an added benefit, interstate recognition makes art teacher certification earned at UMass Dartmouth reciprocally valid in many other states.

This program is designed for students with already strong backgrounds in studio work who want licensure which allows them to work in schools, museums, or social service agencies. Candidates must demonstrate studio competencies in areas specified by the State Department of Education Standard I prior to applying for the state teaching license. While at UMass Dartmouth, licensure students take courses from the listed requirements for the major in Art Education that apply toward state licensure standards, including courses in studio art, the social theory and philosophy of education, human development and learning of art, and teaching methodology. During their required field experience, students will visit schools and other learning sites. The courses and field work provide students with the opportunity and skills to develop effective strategies for work with learners in a variety of settings. Post-baccalaureate Art Education licensure candidates must pass both the Literacy and Content portions of the Massachusetts Test of Educator Licensure (MTEL) as a condition for entering the program.

During their required pre-practicum field experience, students need to select the grade level (PreK-9 or 5-12) in private or public schools in which they are assisting or teaching students. Students must acquire a total of seventy five hours.

The full program requires 27 credits and PSY 201 (3 credits) and its prerequisite PSY 101 (3 credits). Additional credits may be needed if a certificate student lacks prerequisites or depth of studio preparation.

Art Education Courses

The Commonwealth of Massachusetts has adopted a new teacher licensure process. The one-stage life-time certificate is now replaced by a two-stage process in which an initial licensure is earned, followed by professional licensure. Within five years of beginning employment under an initial license, teachers must earn professional licensure in order to maintain professional standing and teach in the public schools. A Master's degree that includes clinical experience and education coursework is required for professional licensure. The department will be offering this degree through its Art Education graduate program, including coursework and experience designed to enable students to qualify for the professional license. Those interested should consult the department about the Art Education master's degree options, and consult the university's *Graduate Catalogue*.

General Education Departmental Requirements

Students majoring in Art Education will meet their departmentally-controlled General Education requirements as follows:

Area E: Satisfied by any university course bearing E credit
Area I, Tier 2: TBD
Area W, Tier 2: Satisfied by ARH 200
Area O: Satisfied by any university course bearing O credit

AED 200 three credits **C**
Observational Strategies in Artistic Development
Field-based pre-practicum opportunities for students to conduct and assess observations of learners and teachers. Students will record, interpret, and analyze behavior in written or digital form. Emphasis is placed on expanding the student's view of the relationship between the environment, developmental stages, and learning objectives. (Formerly titled *Development of Visual Symbols*)

AED 215 three credits **C**
Special Needs: Current Issues
Introduction to the visual arts as a therapeutic instrument, examined through practical experiences, discussions, and readings. The course explores art's potential in diagnosis, physical therapies, and affective and cognitive therapies; explores the variety of special needs students; and discusses current issues and literature. A key goal is to promote understanding in dealing with special needs students in grades N-9 and 5-12.

AED 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see selection of catalogue on Other Learning Experiences.

AED 300 three credits
Methods and Materials: Curriculum Methods in Art Education
Experimental uses of materials and methods and their didactic implications. This course seeks to develop skills in designing curricula for varied age groups which focus on the expressive range of each media. Students will meet for a studio-based session to explore alternative media and techniques, followed by a second session in which studio majors pursue the ideas to create art objects and art education majors pursue the ideas to design lessons and units with which these same ideas may be taught to others. In accordance with the Massachusetts Department of Education, students seeking teaching certification in either N-9 or 5-12 will have readings and field practicum specifically for the intended age range. Students aiming for careers other than teaching will do readings and a field practicum appropriate to those career goals.

AED 310 three credits
Curriculum Design
Development of curriculum units in the visual arts applicable to educational settings in public schools as well as other selected institutions. From a basis in understanding the broad goals of art education, students plan appropriate learning experiences. Curricula will be designed based upon traditional concepts and principles of art in a context of human development, physical and social environment, and aesthetics. In accordance with the recommendations of the Massachusetts Department of Education, students seeking teaching certification in either N-9 or 5-12 will have readings and field practicum specifically for the intended age range. Students aiming for careers other than teaching will do readings and a field practicum appropriate to those career goals.

AED 405 three credits
Social Philosophy and History of Art Education
Relationships between philosophical influences and historical practices in art education. Writings by prominent educators such as Dewey, Read, Langer, and Broudy provide a philosophical framework for analysis of theories by Cizek, Lowenfeld, Eisner, and Gardner. Their theories will be set in a social context in order to describe how the general period and the specific history of each author shaped that individual's thinking. Comparative historical interpretations by Gaitskill, Effland, Korzenik, and others will also be explored.

AED 411 twelve credits
Practicum/Seminar: Elementary
Prerequisite: AED 200, 215, 300, 310, 405; and teaching licensure students must have passed all parts of the MTEL test, both literacy and content area
Practicum experience for which teaching licensure students are assigned to a school corresponding as much as possible with the student's own interests. Working with and supported by a cooperating teacher and supervisor from the University, the student is afforded the opportunity to conduct art experiences under actual classroom conditions and responsibilities. This practicum is a fifteen-week, full-time classroom experience at the elementary level N-9. A weekly seminar will be held at school sites for the student teachers to share insights and problems. Students aiming for careers other than teaching take this course but are placed in a non-school setting.

Gen Ed Note

All Art Education courses satisfy Cultural/ Artistic Literacy; lower division courses are marked **C**, but advanced courses are eligible as well.

AED 412 twelve credits
Practicum/Seminar: Secondary
Prerequisite: AED 200, 215, 300, 310, 405; and teaching licensure students must have passed all parts of the MTEL tests, both literacy and content area
Practicum providing teaching licensure students a fifteen-week, full-time classroom experience under the direction of a university supervisor and working with and supported by a cooperating teacher. The student teacher is afforded the opportunity to conduct art experiences under actual classroom conditions and responsibilities at the secondary level 5-12. A weekly seminar will be held at school sites for the student teachers to share insights and problems about their practicum. Students aiming for careers other than teaching take this course but are placed in a non-school setting.

AED 413 one credit
Children's Art Workshop
Provides practical experience with children ages 6-12 on Saturday mornings in the Art Education rooms. The teaching of the workshop will be based on a humanistic approach to art education and must be taken simultaneously with AED 400.

AED 435 three credits
Art, Artists, Aging, and Enjoyment
Prerequisite: 200-300 level courses in Art/Art Education or 12 or more credits in Gerontology courses, or GRT 310
Art history as it relates to the careers of older artists; the representation of age in art; the design of art programs of use to elders and a review and practice of appropriate media will be presented in a combined lecture and studio format.

AED 460 three credits
Arts for the Elementary Classroom
Students preparing to teach grades K-6 will learn how to integrate art into the curriculum. Methodologies, media, and techniques will be explored to help the classroom teacher who is not an arts specialist extend and integrate art lessons.

AED 470 three credits
Special Topics in Art Education
Offered as needed to present advanced material to advanced undergraduate students. The specific topic is stated when the course is scheduled. May be repeated with change of content.

AED 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

AED 196, 296, 396, 496 variable credit
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Graduate Courses in Art Education

Graduate Courses for Initial Licence
For course descriptions, see undergraduate equivalent courses.

AED 500 three credits
Methods and Materials
Graduate equivalent of AED 300. Graduate-level students must meet additional work expectations.

AED 501 three credits
Observational Strategies
Graduate equivalent of AED 200. Graduate-level students must meet additional work expectations.

AED 505 three credits
Social Philosophy and History
Graduate equivalent of AED 405. Graduate-level students must meet additional work expectations.

AED 510 three credits
Curriculum Design
Graduate equivalent of AED 310. Graduate-level students must meet additional work expectations.

AED 515 three credits
Special Needs: Current Issues
Graduate equivalent of AED 215. Graduate-level students must meet additional work expectations.

AED 511/512 six credits
Graduate Student Teaching
Graduate equivalent of AED 411/412. Graduate-level students must meet additional work expectations.

Regular Graduate Courses

AED 530 three credits (nine credits maximum)
Graduate Studio
Graduate studio work on a tutorial basis, with a required final show. The student may work in any medium providing that s/he has shown a sufficient portfolio of work indicating real promise for study in an area. An art Education faculty member will supervise the project and help secure space and equipment. The studio experience includes regularly scheduled meetings at least five times a semester and individual consultations.

AED 533 three credits
Arts Leadership and Administration
An examination of arts management issues such as communication, research and planning, budgeting, staffing, and information systems. Students conduct field research and must develop a project in conjunction with an agency, school, or nonprofit organization.

AED 534 three credits
Funding for the Arts
How does our government support the arts? or the private sector? How can an individual or organization obtain funding to support projects and initiatives in the arts or education? These and other normative questions will be explored through readings and discussion. Each student will be expected to select a topic and develop a funding proposal or case study from the field.

AED 535 three credits
Art, Artists, Aging, and Enjoyment
An examination of the careers of older artists in history; the representation of age in art; the design of art programs of use to elders; and a review and practice of appropriate media. This course combines lecture and studio formats.

AED 541 three credits
Research: Current Issues
Introduction to research techniques and methodologies in arts education, including historical inquiry, empirical investigations, and ethnographic research. Topics include problem definition, research design, data collection and analysis, and methods of presenting findings. Students will explore and research current issues of importance to art education and related fields through lecture, seminar, and field trip components. Not open to BFA.

Note: Some graduate courses may be open to undergraduates. Please consult your department chairperson. See the *Graduate Catalogue* for graduate general and program requirements.

AED 560 three credits
Arts for the Elementary School
Integrating art into the N-6 curriculum. Students will create curricula which integrate art with other subjects. The class explores methodologies, media, and techniques to help the classroom teacher who is not an arts specialist extend and integrate art lessons.

AED 570 three credits
Special Topic in Art Education
The specific topic is stated when the course is scheduled. May be repeated with change of topic and be offered in lecture or seminar format. Examples of topics offered recently are Integrated Arts, Safer Printmaking, and ARTSLINKS: Interdisciplinary Curriculum Design; Technology in the Arts Classroom; `Maskmaking: Context and Ritual; Art of Teaching Watercolor.

AED 595 variable credit
Independent Study
Prerequisite: Permission of instructor, graduate director, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

AED 596 variable credit
Directed Study
Prerequisite: Permission of instructor, graduate director, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

AED 616 three credits
Clinical Experience—Elementary
AED 617 three credits
Clinical Experience—Secondary
Students develop studies, working in the field, based on their understanding of art education theory, pedagogy, and methodology. Students design their projects or curricula, implement their model through instruction in a classroom, and analyze and assess its efficacy. This clinical study is conducted at a higher level than the pre-licensure student teaching practicum. The course consists of five seminars, site implementation, a supervisory visit, and individual consultations. Clinical sites may be the student's current place of employment or an alternate site arranged in consultation with the instructor. Not open to BFA.

AED 618 three credits
Partnership
Prerequisite: AED 617 or 616
Students work with teachers in regional schools or educational agencies and with college faculty to create and implement new program models that improve school-based experiences. Students make connection to a site and build a working relationship with the staff there; write a proposal; design and plan a program; carry out their collaborative plan; and evaluate its effectiveness. The course provides students with opportunities to grow professionally through sharing, modeling, research, and reflection. It consists of five seminars, site implementation, a supervisory visit, and individual consultations. Not open to BFA.

AED 640 six credits
Advanced Capstone Project—Theoretical or Applied
Prerequisite: AED 541, 616, 617, 618
AED 641 six credits
Advanced Capstone Project—Practice/Studio
Prerequisite: AED 541, 616, 617, 618
Students present a Final Paper/Project for the Theoretical or Applied Project and/or a Final Visual Project or Exhibition for the Practice/Studio Project. The student meets every other week with the instructor or makes equivalent arrangements to ensure that the project is developed well and on time. The instructor decides when the project is ready for a second reader/evaluator, and the student presents the work to them as a committee for correction and final approval. Graded A-F; if more than a semester is required for completion, the work may initially be graded IP. Not open to BFA.

Art History

Faculty and Fields of Interest

The Department of Art History seeks to enhance students' visual critical abilities by exploring analytical approaches to works of art and artifacts from a diversity of cultures. Similarly, the faculty hold that art work is more richly understood in light of those social, cultural, spiritual, and intellectual events, as well as material and individual contributions, that have accompanied its creation. The departments's goals are, using a broad spectrum of instructional methodologies including Internet-based and video conferencing, to provide art history and general education instruction for visual arts studio and art education students, to respond to the general education needs of students across the UMass Dartmouth campus, and to prepare Art History students for employment in art-related professions.

Art History is allied to the liberal arts. It examines ancient to contemporary art and artifacts, including architecture, sculpture, painting, graphics, and crafts, from western and non-western cultures. These are studied in relation to those political, social, cultural, spiritual, and intellectual events that have accompanied their creation, enabling art history graduates to more fully understand and assess critically the visual products of past and present cultures.

The Art History curriculum provides its majors with a broad understanding of the major periods and areas of art history, acquaints them with various methods and theories of art historical study, and allows concentration on topics and periods of the student's choosing. In addition, the major offers opportunities to propose and carry out research projects and to work in arts institutions.

Art History majors develop advanced writing skills as well as verbal and visual analytical abilities. Achieving an Art History degree endows one with a life-long critical tool. Graduates enter the job market with skills equivalent to their counterparts' in the Liberal Arts, and they have the added advantage of visual critical abilities. The major also provides the intellectual training for students wishing to prepare for advanced work in one of the specialized areas of Art History or in a related field.

Lasse B. Antonsen gallery director, modern and contemporary art

Magali M. Carrera ancient Mexico and Peru and traditional art of Africa, America, and Oceania

Liana Cheney renaissance, baroque art (visiting from UMass Lowell)

Memory Holloway modern and contemporary art

Thomas W. Puryear medieval art and American and early modern architecture

Michael D. Taylor (chairperson) medieval and renaissance art

Art History Major BA Degree

Requirements

All students take the following Visual Culture courses:

ARH 125	Visual Culture: Renaissance to Modern Art	3
ARH 150	Visual Culture: Modern to Contemporary Art	3
ARH 200	Visual Culture: Ancient, Medieval, World Art	3

All students complete 27 credits of Art History courses 27
One Art History course must be taken in a non-western area.

All students complete one Art History seminar (ARH 442-490) 3

All students complete one course in studio art 3

Total major credits: 42

Distribution/General Education Requirement

Students are subject to the university's General Education requirement and must also meet our distribution requirement, as outlined here:

- 6 credits, English 101 and 102.
- 6 credits in Literature; courses may be selected from English Literature or Literature in Translation.
- Successful completion of 202 level in a foreign language. Foreign language proficiency is a requirement for the BA degree at the university. The requirements listed for the Bachelor of Arts degree in the College of Arts and Sciences also apply to Art History majors. See the front section of the College of Arts and Sciences chapter of this catalogue for an exact listing of those requirements. Credits vary depending on language placement.
- 9 credits in History and/or Philosophy.
- 6 credits in Science, as defined for general education requirements.
- 3 credits in Mathematics, as defined for general education requirements.
- 12 credits in Social Sciences. Courses for the social science elective may be selected from Computer Science, Psychology, Sociology/Anthropology, Political Science, Economics.
- Free electives, to bring the total number of credits to 120.

General Education Departmental Requirements

Students majoring in Art History will meet their departmentally-controlled General Education requirements as follows:

Area E: Satisfied by any university course bearing E credit
Area I, Tier 2: Satisfied by the combination of ARH 200, a 300-level Art History course, and the 400-level Art History Seminar
Area W, Tier 2: Satisfied by ARH 200 or any 300-level Art History course bearing W credit
Area O: Satisfied by the 400-level Art History seminar

Art History Minor

Students in all fields, especially those in other humanities programs or in art and design, are encouraged to enhance their academic credentials with a Minor in Art History. They will find that it complements their majors and enriches their understanding of contemporary and historical cultures.

Admission to the Minor

Any student who has earned at least 54 university credits with a cumulative GPA of 2.0 and a 2.5 GPA in his or her major may request admission to the Art History Minor. Permission may be granted by the Chairperson, provided such request is made in writing, at any time before graduation. Forms are available from the registrar.

Requirements

- At least 21 hours in Art History (designated by the prefix ARH), at least 12 of which must be above the 100 level and three credits of which must be at the 400 level in Seminar.
- Students must maintain a 2.0 GPA in all Art History courses.

Art History Courses

Gen Ed Note

All Art History courses satisfy Cultural/Artistic Literacy area **C**. Some courses satisfy other requirements, as noted.

ARH 101 three credits **C**
Survey of European Art: Prehistory to 1250
Not for studio art, art history, fine arts, design, or art education majors.
Traces the development of the visual arts (painting and sculpture) and architecture from prehistoric to medieval times. In addition, the course explores the critical relationship between art and the social, political, and economic structures which prevailed at the time of the making of a work of art.

ARH 102 three credits **C**
Survey of European Art: 1250 to 1850
Not for studio art, art history, fine arts, design, or art education majors.
Surveys painting, sculpture, and architecture from the Renaissance to Impressionism.

ARH 125 three credits **C, G**
Studies in Visual Culture: Renaissance to Modern Art
3 lecture hours
Surveys painting, sculpture, and architecture from the Renaissance to Impressionism.

ARH 150 three credits **C, G**
Studies in Visual Culture: Modern to Contemporary Art
3 lecture hours
Prerequisite: ARH 125
Surveys developments in painting and sculpture from the late 19th century to the present. The historical context of major artists and the theoretical, critical, and aesthetic issues surrounding their works will be discussed. (Formerly offered as ARH 103.)

ARH 200 three credits **C, G, W**
Studies in Visual Culture: Ancient, Medieval, and World Art
3 lecture hours
Prerequisites: ARH 125, 150; or permission of instructor
Exploraes the critical relationships between art/architecture and its social, political, and economic contexts. Students will attain an intellectual and visual understanding of significant themes and issues of Ancient, Medieval, and World Art; will think and write critically about social, economic, political, and/or religious structures that influence and formulate visual art traditions; and will gain in-depth knowledge on a specific artist, art period, or theoretical problem through an extended research project.

ARH 298 one to six credits **C**
Experiential Learning
Prerequisites: At least soph. standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see selection of catalogue on Other Learning Experiences.

ARH 306 three credits **C**
Roman Art
Defines the Roman qualities of Roman Art, in contrast to its Etruscan, Greek and Hellenistic forebearers. The development of painting, sculpture and architecture is traced to the time of Emperor Constantine, ca. 325 A.D.

ARH 313 three credits **C**
The Art of Portugal
Major developments in Portuguese art from the 12th century to the present, including painting, sculpture, ceramics, tiles, and architecture. Some topics to be discussed will include the Awakening of Identity; the Art of Reconquest; the Image of Empire; the Rise of the Portuguese Baroque; the Romantic Consciousness; Modernism and the Escola Portugesa; Cafes, Art and Artists of the time of Fernand Pessoa; and recent Portuguese Art: Internationalism, Absorption and Resistances. The study of contemporary art will extend to an examination of film and photography.

ARH 315 three credits **C**
Romanesque Art
Architecture, painting, and sculpture in western Europe from about the year 1000 through the 12th century.

ARH 316 three credits **C**
Gothic Art
Architecture, sculpture, manuscript painting, and stained glass from the beginnings of the Gothic in England, Normandy, and the Isle de France to the internationalization of the style in the 13th and 14th centuries.

ARH 321 three credits **C**
Early Northern Painting
The development of panel painting in France and Flanders from 1400 to the early years of the 16th century. Close attention also is paid to miniature painting, engraving, and the beginnings of printing in this period.

ARH 325 three credits **C, W**
Italian Renaissance Art
A study of the painting, sculpture, and architecture in Italy during the 15th and 16th centuries.

ARH 329 three credits **C**
Portraiture
Issues and problems in portraiture, of all media, from the Renaissance through the 20th century.

ARH 336 three credits **C**
Baroque Art in Italy and France
A study of painting, sculpture, and architecture in Italy and France during the 17th century.

ARH 337 three credits **C**
Baroque Art in Flanders, Holland, and Spain
A study of 17th-century painting and graphics in these countries, with in-depth studies of Rubens, Rembrandt, and Velázquez.

ARH 339 three credits **C**
18th-Century European Painting
A study of the 18th-century European painting, in France, Britain, Italy, and Spain.

ARH 340 three credits **C**
Late 18th-Century Art in Britain and France
An investigation of themes and issues, including the Academy, Neoclassicism, and Historicism.

ARH 342 three credits **C, W**
Impressionism to Symbolism
Prerequisite: ARH 102 or 125, or permission of instructor
An in-depth study of art from the 1860s to the early years of the 20th century.

ARH 343 three credits **C**
Cubism
Prerequisite: ARH 102 or 125, or permission of instructor
This course explores the origin and development of Cubism in France and its impact on artistic developments throughout Europe and the Americas. The major emphasis of this course is on painting and sculpture.

ARH 344 three credits **C**
Expressionism
Prerequisite: ARH 102 or 125, or permission of instructor
A cultural and historical study of Expressionism from its late 19th-century forerunners through contemporary Neo-Expressionism.

ARH 347 three credits **C**
Dada and Surrealism
Prerequisite: ARH 102 or 125, or permission of instructor
A detailed investigation of these avant-garde movements in Switzerland, Germany, France, Italy, and the U.S.A. The influence of both Dada and Surrealism on contemporary art will be examined.

ARH 349 three credits **C**
Development of Modern Architecture
A study of world architecture from the mid-nineteenth century to 1950.

ARH 350 three credits **C**
Picasso
Prerequisite: ARH 102 or 125, or permission of instructor
An in-depth study of Picasso's art, beginning with the youthful and academic work of the 1890s and concluding with the expressionistic and erotic work of the 1960s and 70s.

ARH 352 three credits **C**
American Architecture to 1900
A study of architecture in North America from the first settlers to the early work of Frank Lloyd Wright.

ARH 353 three credits **C**
Bauhaus
Prerequisite: ARH 102 or 125, or permission of instructor
Emphasizes the major innovations of the artists, architects, designers, and craftspeople at the Bauhaus in the context of their times. The range of works discussed will emphasize specific media concerns and multimedia experiments.

ARH 354 three credits **C**
Russian and Soviet Art: From the 1860s to the Present
Prerequisite: ARH 102 or 125, or permission of instructor
An in-depth study of themes and issues in 19th and 20th century Russian and Soviet art, with special focus on Malevich and Suprematism; Kandinsky and the "Blue Rider"; Tatlin, Lissitzsky, Rodchenko and Constructivism; and the Post-Modern period.

ARH 355 three credits **C**
American Painting
Prerequisite: ARH 102 or 125, or permission of instructor
A survey of major artists and tendencies from the earliest colonial limners to the triumph of Abstract Expressionism in the mid-20th century.

ARH 356 three credits **C**
Art Since 1945
Prerequisite: ARH 102 or 125, or permission of instructor
A study of major developments in contemporary art.

ARH 360 three credits **C, G, W**
Survey of Primitive Art
An introduction to the arts of Africa, Oceania, and the Americas. The course will emphasize method, theory, and cross-cultural analysis.

ARH 361 three credits **C, G**
Art and Culture of Africa
A survey of the arts, crafts, and architecture of Africa. Historical developments, stylistics, and aesthetics will be investigated within a sociocultural framework.

ARH 363 three credits **C, G**
Art and Culture of Ancient Mexico
An examination of the arts and architecture of Mexico and Central America before the arrival of the Spanish.

ARH 364 three credits **C, G**
Art and Culture of Ancient Peru
A survey of art and architecture of the high cultures of Peru from 5000 B.C. to 1500 A.D.

ARH 365 three credits **C**
North American Indian Art I
Survey of the arts, crafts and architecture of the Native American populations in the Southwest, California and the Plains.

ARH 366 three credits **C**
North American Indian Art II
This course will investigate the arts and crafts of the Northwest Coast, The Arctic area, the Eastern woodlands, and the Southeast.

ARH 367 three credits **C**
Oceanic Art
A detailed survey of the arts and crafts of Melanesia, the Pacific Islands, and Australia. Historical and cultural determinants will be examined.

ARH 368 three credits **C, G, W**
Critical Perspectives of the History of Art
The history of art from the critical perspectives of post-colonial and visual culture theory. Students will review examples of post-colonial literature and the major themes of post-colonial and visual culture theory. These theories will be used to conceptualize and critique the function of race and colonialism in formulation of the history of western art.

ARH 369 three credits **C**
The Arts of Asia
A contextual study of the arts of India, China, Japan, and Southern Asia. This course concentrates on selected case studies, monuments, or schools of art, that together form an overview of the major currents of Asian art and culture.

ARH 370 three credits **C**
Readings in Visual Culture
Prerequisite: ARH 103 or 150
Investigates important issues in the fields of design and artisanry through study of visual objects and readings, and to show how these fields are linked stylistically and conceptually.

ARH 375 three credits **C, W**
Exhibiting Culture: The Museum as Artifact
Prerequisite: ARH 125 or ARH 150, or permission of instructor
Exploration of how a museum represents sets of ideas and ideals of specific culture. The course provides a historical and theoretical overview of museums and their exhibitions.

ARH 380 three credits **C, D, W**
Feminist Perspectives on Art History
Prerequisites: ARH 101 or 200, 102 or 125, and WMS 101; or permission of instructor
Analyzes the feminist critique of the history of art. This course will review recent critiques of both art and culture through an investigation of the production and evaluation of art and the role of the artist in Western and non-Western cultures. Also offered as WMS 380.

ARH 385 three credits **C**
Women Artists and the Histories of Art
Provides knowledge and understanding of the art made by women from the Late Medieval period through Contemporary periods of art. This study will be set in the context of specific social, familial, economic, and psychological conditions of the period in which the art was made. The course will familiarize students with recent feminist critiques of visual culture.

ARH 442 to **490 C**
Seminars
Prerequisite: Permission of instructor
Students will examine the bibliography and

Note: Graduate ARH courses are not open to undergraduate students.

research methods of the discipline of Art History. They will pursue extensive research which will be presented in written and oral formats.

ARH 445 three credits **C**
Issues in 20th-Century Art

ARH 450 three credits **C**
Problems in American Art: New England Architecture

ARH 460 three credits **C**
Problems in Primitive Art

ARH 461 three credits **C**
Problems in Pre-Columbian Art

ARH 481 three credits **C**
Literature of Art: Iconography

ARH 482 three credits **C**
Literature of Art: Artists' Biographies

ARH 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

ARH 196, 296, 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Graduate Courses in Art History

ARH 500 three credits
Method and Theory in Art History
An introduction to art historical methodology with application to studio problems. Oral reports and research papers are required.

ARH 525 three credits
Seminar: Issues and Problems in Art History
Prerequisite: ARH 200 or comparable course, or permission of instructor
An in-depth study of major artists and movements since World War II, with a focus on current issues, exhibitions, and events within national and international art. The course will question the relationship between form and subject matter, and focus on the role of art in contemporary life. Elective course for MFA students; may be used toward MAE degree.

ARH 595 variable credit
Independent Study
Prerequisites: Permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

ARH 596 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Design

The department offers two undergraduate degrees, a BFA in Visual Design and a BFA in Textile Design/Fiber Arts.

Under those two headings students pursue work in a wide variety of options. These options are grouped into two general categories, visual arts related to visual design professions (Visual Design) and visual arts related to the crafts professions (Artisanry).

Visual design options include Graphic Design, Illustration, Photography, and Electronic Imaging.

Artisanry options include Ceramics, Jewelry/Metals, and Textile Design/Fiber Arts.

The Design Department takes advantage of being in a university structure—providing a challenging stimulus within the whole, interrelating the verbal with the visual and the conceptual with the perceptual. Because the function of Design is to communicate, it has a built-in relationship with all disciplines, and involves cultural, behavioral, social and technological factors.

Admission to specific options requires submission of portfolio.

All transfer students who wish to be admitted to courses marked with a "*" above the sophomore level must bring a portfolio to transfer orientation. Acceptance into advanced courses is rare, not automatic.

Faculty and Fields of Interest

Scott Ahrens electronic imaging

Jean Francois Allaux illustration, electronic imaging

David Allen photography

David Chapman graphic design

Vicky Crayhon photography

Jan Fairbairn graphic design, typography

Elaine Fisher photographic imaging, electronic imaging

Laura Franz graphic design, typography, electronic imaging

Harvey Goldman electronic imaging

Susan Hamlet jewelry/metals

Rebecca Hutchinson ceramics

Spencer Ladd (chairperson) graphic design, typography, photographic imaging, electronic imaging

James Lawton ceramics

Yoon Soo Lee graphic design, typography, electronic imaging

Bruce Maddocks illustration, graphic design

Geraldine Millham typography

Mark Millstein electronic imaging

Ziddi Msangi graphic design, typography, electronic imaging

Sheila Oliveira photography

Marjorie Durko Puryear textile design/fiber arts

Alan Burton Thompson (spokesperson, artisanry) jewelry/metals

Shawn Towne electronic imaging

Stephen Whittlesey wood/furniture design

Howard Windham graphic design, typography, history of design history of design

Janine Wong graphic design, typography

Visual Design Major
BFA degree

Visual Design Options

The Visual Design area is a cluster of professionally-oriented options: Graphic Design, Illustration, Photography, and Electronic Imaging. The emphasis throughout these programs is communication. Students explore visual communication in the widest sense, employing both traditional and contemporary electronic and computer technologies.

Faculty representing a variety of philosophies and viewpoints teach visual design as an art form, a craft, or as information dissemination for education, business and commerce, or the entertainment industries. The modern visual artist/designer must be broadly educated, articulate, and literate, an active participant in all levels of a project, not merely someone who dutifully packages the finished product.

Student Reviews

Each Visual Design Option has a list of designated courses, each of which requires a grade of C or better. A student who receives a C- or below in a designated course shall be subject to dismissal from the major option. The student shall be reviewed by the department chairperson (or designee) and a minimum of one faculty member from the student's Option. A review will determine whether the student may continue in the Option. If continuance is denied, the student will be offered academic advising. If continuance is approved, conditions will be stipulated in writing. If the course must be repeated, it will be under university regulations—that a student may repeat, but only if space is available and with consent of the chairperson and advisor. If the course to be repeated is a prerequisite for the next required level, the student's advancement may be delayed by a full year. A student who receives a second grade of C- in a designated course during a subsequent semester shall be subject to dismissal from all Visual Design options.

Graphic Design Option

The Graphic Design option emphasizes the process of visual communication in a context of message, audience, environment, and technology. Students learn how to approach research and analysis of content as part of the design process, and learn to develop graphic translations—symbols, books, posters, interactive media—based on that research and analysis. In addition, classical and contemporary issues of typography are explored within the program. Projects in diverse media include letterform design, information design, book and periodical design, letterpress printing, video, animation, websites, and cd-roms.

Students are introduced to an historical context of visual design as well as to state-of-the-art practices. This program prepares students for the diverse opportunities available in professional design practice as well as a continuing quest for personal and creative growth.

Order of courses
Graphic Design I may be taken before Graphic Design II. Typography II may also be taken before Typography I.

Free Electives
All university courses (including Studios and Studio Electives) may be used as Free Electives.

***Designated Course**
Students in this program must complete the course(s) indicated with a grade of C or better; if a C- or lower is received, the course must be retaken. For full details, see the "Student Reviews" paragraph on the first page of this Design department chapter.

General Education Departmental Requirements
Students majoring in Visual Design/Graphic Design will meet their departmentally-controlled General Education requirements as follows:

Area E: Satisfied by any university course bearing E credit
Area I, Tier 2: TBD
Area W, Tier 2: Satisfied by ARH 200 and DES 451 and 452
Area O: Satisfied by any university course bearing O credit

Requirements

		Credits
Foundation		
FOU 101	Visual Arts Colloquium I	1
FOU 102	Visual Arts Colloquium II	1
FOU 110	Foundation: Structural Drawing	3
FOU 112	Foundation: Life Drawing	3
FOU 114	*2D Workshop	2
FOU 115	*Visual Language	2
FOU 124	3D Concept	2
FOU 125	3D Workshop	2
Art History		
ARH 125	Visual Culture: Renaissance to Modern Art	3
ARH 150	Visual Culture: Modern to Contemp. Art	3
ARH 200	Visual Culture: Ancient, Medieval, World Art	3
ARH	Art History elective	3
General Education/Distribution		
ENL 101	Critical Writing and Reading I	3
ENL 102	Critical Writing and Reading II	3
ENL	English literature elective	3
MTH	Mathematics elective	3
	Science electives	6
Non Studio Electives (select to meet remaining General Education requirements)		
	Five courses at any level	15
	One course at 300 or 400 level	3
Free Electives Three courses at any level		9
Major / Option Studios		
DES 251	*Graphic Design I	3
DES 252	*Graphic Design II	3
DES 351	*Graphic Design III	3
DES 352 or 354	*Graphic Design IV	3
DES 451 or 453	*Graphic Design V	6
DES 452 or 454	*Graphic Design VI	6
Major / Option Additional Requirements, Studios		
DES 282	Photo Imaging II	3
DES 253	*Typography I	3
DES 254	*Typography II	3
DES 283	Electronic Imaging I	3
DES 331	History of Design	3
DES 353	*Typography III	3
Miscellaneous Studios		
FIA	200-Level Drawing I (consult advisor on selection)	3
FIA	200-Level Drawing II (consult advisor on selection)	3
DES or FIA	Three Studio Electives	9
Total credits:		**130**

Illustration Option

The aim of the Illustration option is to equip all of its graduating students with the skills, habits, and knowledge necessary for successful professional practice in the field. Conceptual imaginativeness, rendering and compositional fluency, and an originality of stylization are understood to be of equal and complementary importance. Students learn the uses of symbolism, sequencing, advanced perspective, and the integration of digital processes. The history, marketing, and ethics of the trade are examined, as are the various applications of illustration: editorial, advertising, book, children's book, comic book, and documentary illustration; seniors choose an emphasis based on individual abilities and interests. A professional portfolio of work is expected for graduation.

Recommended Studio Electives

DES 211	Color Studio
DES 213, 214	Calligraphy I-II
DES 215	Structural Representation
DES 251	Graphic Design I
*DES 254	Typography II
DES 281, 282	Photo. Imaging I, II
DES 317	Art of the Book
*DES 383 to 484	Electronic Imaging III-VI
FIA 223, 224	Nature Drawing I, II
FIA 225	Object Drawing
FIA 285 to 482	Printmaking (ALL)
FIA 311	Composition & Design
*FIA 421, 422	Drawing V, VI

Order of courses

Typography II may be taken before Typography I; both are prerequisite for Electronic Imaging III-VI. Photographic Imaging I-II are prerequisites for Electronic Imaging III.

Free Electives

All university courses (including Studios and Studio Electives) may be Free Electives.

***Designated Course**

Students in this program must complete the course(s) indicated with a grade of C or better; if a C- or lower is received, the course must be retaken. For full details, see the "Student Reviews" paragraph on the first page of this Design department chapter.

General Education Departmental Requirements

Students majoring in Visual Design/ Illustration will meet their departmentally-controlled General Education requirements as follows:
Area E: Satisfied by a course with E credit
Area I, Tier 2: TBD
Area W, Tier 2: Satisfied by ARH 200
Area O: Satisfied by a course with O credit

Requirements

		Credits
Foundation		
FOU 101	Visual Arts Colloquium I	1
FOU 102	Visual Arts Colloquium II	1
FOU 110	Foundation: Structural Drawing	3
FOU 112	Foundation: Life Drawing	3
FOU 114	*2D Workshop	2
FOU 115	*Visual Language	2
FOU 124	3D Concept	2
FOU 125	3D Workshop	2
Art History		
ARH 125	Visual Culture: Renaissance to Modern Art	3
ARH 150	Visual Culture: Modern to Contemp. Art	3
ARH 200	Visual Culture: Ancient, Medieval, World Art	3
ARH	Art History elective	3
General Education/Distribution		
ENL 101	Critical Writing and Reading I	3
ENL 102	Critical Writing and Reading II	3
ENL	English literature elective	3
MTH	Mathematics elective	3
	Science electives	6
Non Studio Electives (select to meet remaining General Education requirements)		
	Five courses at any level	15
	One course at 300 or 400 level	3
Free Electives Three courses at any level		9
Major / Option Studios		
DES 221	*Illustration I,	3
DES 222	*Illustration II	3
DES 321	*Illustration III	3
DES 322	*Illustration IV	3
DES 421	*Illustration V	6
DES 422	*Illustration VI	6
Major / Option Additional Requirements, Studios		
FIA 241	Painting I	3
FIA 242	Painting II	3
DES 283	Electronic Imaging I	3
FIA 341	Painting III	3
FIA 321	Figure Drawing III	3
FIA 342 or 322	Painting IV **OR** Figure Drawing IV	3
Miscellaneous Studios		
FIA	200-Level Drawing I (consult advisor on selection)	3
FIA	200-Level Drawing II (consult advisor on selection)	3
DES 421 AND	Figure Drawing V	
DES 422	Figure Drawing IV	3
OR		3
DES 441 AND	Painting V	
DES 442	Painting VI	
DES or FIA	Studio Elective	3
Total credits:		**130**

Electronic Imaging Option

Students in Electronic Imaging are introduced to the design process, language, and technology involved in the field of digital communication. Skills obtained in the required graphic design courses are necessary prerequisites to prepare students for advanced study in electronic imaging. At the end of the freshman year, students wishing to specialize in Electronic Imaging begin concentrated study in digital imaging, animation, and interactive multimedia. The Electronic Imaging Option offers students the opportunity to improve their critical thinking and aesthetic abilities while gaining an in-depth understanding of the strengths and weaknesses of various types of media and technologies. Students learn to choose the appropriate medium for each project and to exploit the strengths of various media to meet the needs of the project at hand. After completing the program, students are prepared to obtain work in numerous creative positions including art director/creative director, web designer, animator (2D and/or 3D), multimedia author, broadcast designer, software application design, interface designer, information designer, entrepreneur, producer, product designer, environmental designer, scientific visualization, videographer, video editor, educator, multimedia programmer, artist, advertising, special effects designer, cartoonist, publication designer, and package designer.

Order of courses
DES 252 is a prerequisite for Electronic Imaging III-VI. Typography II may be taken before Typography I and is required for Electronic Imaging III, VI.

Free Electives
All university courses (including Studios and Studio Electives) may be used as Free Electives.

***Designated Course**
Students in this program must complete the course(s) indicated with a grade of C or better; if a C- or lower is received, the course must be retaken. For full details, see the "Student Reviews" paragraph on the first page of this Design department chapter

Requirements

		Credits
Foundation		
FOU 101	Visual Arts Colloquium I	1
FOU 102	Visual Arts Colloquium II	1
FOU 110	Foundation: Structural Drawing	3
FOU 112	Foundation: Life Drawing	3
FOU 114	*2D Workshop	2
FOU 115	*Visual Language	2
FOU 124	3D Concept	2
FOU 125	3D Workshop	2
Art History		
ARH 125	Visual Culture: Renaissance to Modern Art	3
ARH 150	Visual Culture: Modern to Contemp. Art	3
ARH 200	Visual Culture: Ancient, Medieval, World Art	3
ARH	Art History elective	3
General Education/Distribution		
ENL 101	Critical Writing and Reading I	3
ENL 102	Critical Writing and Reading II	3
ENL	English literature elective	3
MTH	Mathematics elective	3
	Science electives	6
Non Studio Electives (select to meet remaining General Education requirements)		
	Five courses at any level	15
	One course at 300 or 400 level	3
Free Electives Three courses at any level		9
Major / Option Studios		
DES 282	*Photographic Imaging II	3
DES 283	*Electronic Imaging I	3
DES 284	*Electronic Imaging II	3
DES 383	*Electronic Imaging III	3
DES 384	*Electronic Imaging IV	3
DES 483	*Electronic Imaging V	6
DES 484	*Electronic Imaging VI	6
Major / Option Additional Requirements, Studios		
DES 251	*Graphic Design I	3
DES 252	*Graphic Design II	3
DES 254	*Typography II	3
Miscellaneous Studios		
FIA	200-Level Drawing I (consult advisor on selection)	3
FIA	200-Level Drawing II (consult advisor on selection)	3
DES or FIA	Five Studio Electives	15
Total credits:		**130**

General Education Departmental Requirements

Students majoring in Visual Design/Electronic Imaging will meet their departmentally-controlled General Education requirements as follows:

Area E: Satisfied by any university course bearing E credit
Area I, Tier 2: TBD
Area W, Tier 2: Satisfied by ARH 200 and DES 484
Area O: Satisfied by any university course bearing O credit

Photography Option

The profound impact of the digital revolution has resulted in a broadening of the entire field of photography, both in university programs and the world at large. Students are provided with instruction in both traditional and digital approaches to photographic study within UMass Dartmouth's well-maintained photography lab and department media lab. Students are provided with instruction in both traditional and digital approaches to photographic study.

Introductory courses include standard wet-processes along with digital media processes. Extensive technical information is presented to ensure practical understanding of how to use both photographic and computer equipment. Specific assignments dealing with visual and conceptual issues are presented to begin the process of understanding more complex visual concepts.

Intermediate courses begin the exploration of more advanced analog and digital photographic techniques. Attention is focused strongly on maintaining the coherence of visual elements within images, as well as discovery of a personal vision.

Advanced courses emphasize the development of a coherent body of work. These upper level courses present opportunities for more self-directed projects that lead to a senior portfolio exhibition of high professional quality.

Personal artistic growth is expected at every level and is fostered through numerous group and individual critiques with instructors. In keeping with UMass Dartmouth's general education goals, competence in expression is emphasized in both verbal and written form.

Free Electives
All university courses (including Studios and Studio Electives) may be used as Free Electives.

***Designated Course**
Students in this program must complete the course(s) indicated with a grade of C or better; if a C- or lower is received, the course must be retaken. For full details, see the "Student Reviews" paragraph on the first page of this Design department chapter.

Requirements:

		Credits
Foundation		
FOU 101	Visual Arts Colloquium I	1
FOU 102	Visual Arts Colloquium II	1
FOU 110	Foundation: Structural Drawing	3
FOU 112	Foundation: Life Drawing	3
FOU 114	*2D Workshop	2
FOU 115	*Visual Language	2
FOU 124	3D Concept	2
FOU 125	3D Workshop	2
Art History		
ARH 125	Visual Culture: Renaissance to Modern Art	3
ARH 150	Visual Culture: Modern to Contemp. Art	3
ARH 200	Visual Culture: Ancient, Medieval, World Art	3
ARH	Art History elective	3
General Education/Distribution		
ENL 101	Critical Writing and Reading I	3
ENL 102	Critical Writing and Reading II	3
ENL	English literature elective	3
MTH	Mathematics elective	3
	Science electives	6
Non Studio Electives (select to meet remaining General Education requirements)		
	Five courses at any level	15
	One course at 300 or 400 level	3
Free Electives Three courses at any level		9
Major / Option Studios		
DES 281	*Photographic Imaging I	3
DES 282	*Photographic Imaging II	3
DES 381	*Photographic Imaging III	3
DES 382	*Photographic Imaging IV	3
DES 481	*Photographic Imaging V	6
DES 482	*Photographic Imaging VI	6
Major / Option Additional Requirements, Studios		
DES 251	*Graphic Design I **OR** Studio elective	3
DES 283	Electronic Imaging I	3
DES 284	*Electronic Imaging II **OR** Studio elective	3
DES 332	History of Photography	3
DES 385	Studio Photography	3
FIA 311	Composition & Design	3
Miscellaneous Studios		
FIA	200-Level Drawing I (consult advisor on selection)	3
FIA	200-Level Drawing II (consult advisor on selection)	3
DES or FIA	Three Studio Electives	9
Total credits:		**130**

General Education Departmental Requirements
Students majoring in Visual Design/Photography will meet their departmentally-controlled General Education requirements as follows:

Area E: Satisfied by any university course bearing E credit
Area I, Tier 2: DES 283
Area W, Tier 2: Satisfied by ARH 200
Area O: Satisfied by DES 332

Artisanry Areas

The Artisanry programs at UMass Dartmouth have earned a national reputation for excellence in craft education. Undergraduates in Artisanry may pursue BFA options in Ceramics and Jewelry/Metals. They may also major in Textile Design/Fiber Arts. A graduate degree, the MFA in Artisanry, offers specialization in Ceramics, Fibers, Metals, or Wood. Wood/Furniture is offered on the undergraduate level as an elective.

The educational philosophy of the Artisanry programs has evolved from the craft tradition of functional object making, emphasizing professional standards in technical skill and design, knowledge of history of the craft, The craft in relation to popular culture, and personal aesthetic development.

Frequent presentations in each area by visiting artists, lecturers, and designers representing diverse fields supplement the artisanry student's education. Students are challenged to extend their creative involvement into the areas of object production, artistic expression, or design for industry. The goal is to instill the confidence and self-discipline necessary to sustain productive artistic careers.

The studio facilities, located at the university's New Bedford campus, contain state-of-the-art equipment and have ample work areas that encourage artistic development.

Ceramics Option

Ceramics at UMass Dartmouth balances between traditional and non-traditional work and encourages both sculptural and functional approaches. A variety of clay techniques and forming processes are taught, including hand-building, wheel-throwing, and slip-casting. Ceramics students learn how to use clay and glaze materials, to build and fire kilns, and to utilize the history of their craft. The Ceramics faculty encourages in its students individual exploration and professional goals.

Recommended Studio Electives
Courses below may be used as Studio Electives or as Free Electives.

DES 305 Issues & Criticism in Ceramic Arts
DES 306 Moldmaking

Free Electives
All university courses (including Studios and Studio Electives) may be used as Free Electives.

***Designated Courses**
Students in this program must complete the course(s) indicated with a grade of C or better; if a C- or lower is received, the course must be retaken. For full details, see the "Student Reviews" paragraph on the first page of this Design department chapter.

General Education Departmental Requirements
Students majoring in Visual Design/ Ceramics will meet their departmentally-controlled General Education requirements as follows:

Area E: Satisfied by any university course bearing E credit
Area I, Tier 2: TBD
Area W, Tier 2: Satisfied by ARH 200
Area O: Satisfied by any university course bearing O credit

Requirements

		Credits
Foundation		
FOU 101	Visual Arts Colloquium I	1
FOU 102	Visual Arts Colloquium II	1
FOU 110	Foundation: Structural Drawing	3
FOU 112	Foundation: Life Drawing	3
FOU 114	*2D Workshop	2
FOU 115	*Visual Language	2
FOU 124	3D Concept	2
FOU 125	3D Workshop	2
Art History		
ARH 125	Visual Culture: Renaissance to Modern Art	3
ARH 150	Visual Culture: Modern to Contemp. Art	3
ARH 200	Visual Culture: Ancient, Medieval, World Art	3
ARH	Art History elective	3
General Education/Distribution		
ENL 101	Critical Writing and Reading I	3
ENL 102	Critical Writing and Reading II	3
ENL	English literature elective	3
MTH	Mathematics elective	3
	Science electives	6
Non Studio Electives (select to meet remaining General Education requirements)		
	Five courses at any level	15
	One course at 300 or 400 level	3
Free Electives Three courses at any level		9
Major / Option Studios		
DES 291	*Ceramics I	3
DES 292	*Ceramics II	3
DES 391	*Ceramics III	3
DES 392	*Ceramics IV	3
DES 491	*Ceramics V	6
DES 492	*Ceramics VI	6
Major / Option Additional Requirements, Studios		
DES 303	Ceramic traditions	3
DES 304	Clay & Glazes I	3
DES 307	Clay & Glazes II	3
DES 308	Kiln-Building	3
DES 283 **or** 372	Electronic Imaging I **OR** Textile Design for Computer Design	3
DES or FIA	Studio Elective	3
Miscellaneous Studios		
FIA	200-Level Drawing I (consult advisor on selection)	3
FIA	200-Level Drawing II (consult advisor on selection)	3
DES or FIA	Three Studio Electives	9
Total credits:		**130**

Jewelry/Metals Option

At UMass Dartmouth, Jewelry/Metals offers a comprehensive and diverse understanding of the technical and aesthetic potential of metal. Earlier studies feature skills for metal fabrication, construction, forming, and surface treatment, while later, more advanced studies explore such techniques as forging, casting, stone-setting, chasing/repousée, holloware, enameling, and die-forming. As students gain technical skills, they are encouraged to grow in expressive ability and to strive toward professionalism.

Free Electives
All university courses (including Studios and Studio Electives) may be used as Free Electives.

***Designated Courses**
Students in this program must complete the course(s) indicated with a grade of C or better; if a C- or lower is received, the course must be retaken. For full details, see the "Student Reviews" paragraph on the first page of this Design department chapter.

General Education Departmental Requirements
Students majoring in Visual Design/Jewelry-Metals will meet their departmentally-controlled General Education requirements as follows:

Area E: Satisfied by any university course bearing E credit
Area I, Tier 2: TBD
Area W, Tier 2: Satisfied by ARH 200
Area O: Satisfied by any university course bearing O credit

Requirements

		Credits
Foundation		
FOU 101	Visual Arts Colloquium I	1
FOU 102	Visual Arts Colloquium II	1
FOU 110	Foundation: Structural Drawing	3
FOU 112	Foundation: Life Drawing	3
FOU 114	*2D Workshop	2
FOU 115	*Visual Language	2
FOU 124	3D Concept	2
FOU 125	3D Workshop	2
Art History		
ARH 125	Visual Culture: Renaissance to Modern Art	3
ARH 150	Visual Culture: Modern to Contemp. Art	3
ARH 200	Visual Culture: Ancient, Medieval, World Art	3
ARH	Art History elective	3
General Education/Distribution		
ENL 101	Critical Writing and Reading I	3
ENL 102	Critical Writing and Reading II	3
ENL	English literature elective	3
MTH	Mathematics elective	3
	Science electives	6
Non Studio Electives (select to meet remaining General Education requirements)		
	Five courses at any level	15
	One course at 300 or 400 level	3
Free Electives Three courses at any level		9
Major / Option Studios		
DES 293	*Jewelry/Metals I	3
DES 294	*Jewelry/Metals II	3
DES 393	*Jewelry/Metals III	3
DES 394	*Jewelry/Metals IV	3
DES 493	*Jewelry/Metals V	6
DES 494	*Jewelry/Metals VI	6
Major / Option Additional Requirements, Studios		
DES 126	Art, Craft, and Popular Objects **OR** Studio Elective	3
DES 395	Enameling	3
DES 283 **or** 372	Electronic Imaging I **OR** Textile Design for Computer Design	3
DES or FIA	Studio Elective	3
DES or FIA	Studio Elective	3
DES or FIA	Studio Elective	3
Miscellaneous Studios		
FIA	200-Level Drawing I (consult advisor on selection)	3
FIA	200-Level Drawing II (consult advisor on selection)	3
DES or FIA	Three Studio Electives	9
Total credits:		**130**

Textile Design/Fiber Arts Major
BFA degree

The curriculum of the Bachelor of Fine Arts in Textile Design/Fiber Arts balances woven and printed textile design for industry with explorations in fiber art. The student learns about the structure and decoration of cloth through exploration of creative concerns and formal design issues. Textile function and use are explored through the making of yardage, garments, and other textile art objects. History of world textiles is an important part of the program.

The main elements of the curriculum include:

- Hand Weaving using multi-harness looms, spinning, and basketry constructions.
- Surface Design on fabric including screen and block printing and resist-dye techniques. Sewing techniques are also introduced.
- Textile Design, the study of *croquis* and repeat designs in a wide range of hand-rendering techniques on paper, with industry-standard colorings and coordinate design work for portfolio presentation.
- Computer Aided Design for Textiles, which extends the design process. Textile-specific computer software, including NedGraphics and Monarch's Pointcarre, offer connections to design processes used in industry.

Graduation requirements include participation in the annual senior Artisanry exhibition, and a formal portfolio review conducted by a visiting designer. Internships with industry, textile production studios, or museum programs are encouraged. Active professional alumni aid students in job placement after graduation.

Free Electives
Any university course (including Studios and Studio Electives) may be used as Free Elective.

***Designated Courses**
Students in this program must complete the course(s) indicated with a grade of C or better; if a C- or lower is received, the course must be retaken. For full details, see the "Student Reviews" paragraph on the first page of this Design department chapter.

General Education Requirements for Visual Design/Textile Design majors:
Area E: Satisfied by any university course bearing E credit
Area I, Tier 2: TBD
Area W, Tier 2: Satisfied by ARH 200
Area O: Satisfied by DES 370 or any university course bearing O credit

Requirements

		Credits
Foundation		
FOU 101	Visual Arts Colloquium I	1
FOU 102	Visual Arts Colloquium II	1
FOU 110	Foundation: Structural Drawing	3
FOU 112	Foundation: Life Drawing	3
FOU 114	*2D Workshop	2
FOU 115	*Visual Language	2
FOU 124	3D Concept	2
FOU 125	3D Workshop	2
Art History		
ARH 125	Visual Culture: Renaissance to Modern Art	3
ARH 150	Visual Culture: Modern to Contemp. Art	3
ARH 200	Visual Culture: Ancient, Medieval, World Art	3
ARH	Art History elective	3
General Education/Distribution		
ENL 101	Critical Writing and Reading I	3
ENL 102	Critical Writing and Reading II	3
ENL	English literature elective	3
MTH	Mathematics elective	3
	Science electives	6
Non Studio Electives (select to meet remaining General Education requirements)		
	Five courses at any level	15
	One course at 300 or 400 level	3
Free Electives Three courses at any level		9
Major / Option Studios		
DES 277	*Textile Design I	3
DES 278	*Textile Design II	3
DES 373 AND	*Weaving III	
DES 374	*Weaving IV	3
OR		**3**
DES 377 AND	*Textile Design III	
DES 378	*Textile Design IV	
DES 476	*Senior Fibers I	3
DES 477	*Textile Design/Weaving V	3
DES 478	*Textile Design/Weaving VI	3
DES 479	*Senior Fibers II	3
Major / Option Additional Requirements, Studios		
DES 273	Weaving I	3
DES 274	Weaving II	3
TES 300	Fabric Design and Structure I	3
TES 312	Fabric Design and Structure II	3
DES or FIA	Studio Elective	3
DES 370	History of Textiles **OR** Studio Elective	3
DES 372	Textile Design/Computer Design	3
Miscellaneous Studios		
FIA	200-Level Drawing I (consult advisor on selection)	3
FIA	200-Level Drawing II (consult advisor on selection)	3
DES or FIA	Three Studio Electives	9
Total credits:		**130**

Visual Design Courses

Gen Ed Note

All Design courses satisfy Cultural/Artistic Literacy; lower division courses are marked **C**, but advanced courses are eligible as well. Some courses satisfy other requirements, as noted.

Visual Design—Courses in Common

DES 126 three credits **C**
Art, Craft, and Popular Objects
Survey of the visual arts and consumer products from the 40s to the 80s. The objects we live with, use and wear reflect the beliefs, attitudes and tastes of the time. This course offers a survey of the development of the pop object, product design and craft media from World War II to the present. An overview of world events, art and architecture, political and social change will be included to provide context and chronology.

DES 211 three credits **C**
Color Studio
Prerequisite: FOU 114, 115
A second-year course for students within the design department. Emphasis is on an exploration of major concepts of color use and theory for artists. Color pigments are used to achieve expressive variations in palettes.

DES 215 three credits **C**
Structural Representation
Provides the student with experience in handling volume and spatial arrangements.

DES 216 three credits **C**
Dimensional Design
Prerequisite: DES 215 or permission of instructor
For Art, Engineering and other students wishing to pursue projects in Public Art Proposals or in architectural, sculptural, or environmental settings. Multidisciplinary concept of design, technical drawing, site study, perspective renderings, structural and fabrication techniques are explored.

DES 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see selection of catalogue on Other Learning Experiences.

DES 300 three credits
Concepts in Design
Offered as needed to present material in he design field. The specific topic is stated when the course is scheduled. May be repeated with change of content

DES 333/533 three credits
On Creativity
Prerequisites: ENL 101, 102
Basic patterns of conscious and unconscious information processing underlying artistic, humanistic, and scientific inspiration, discovery, and invention.

DES 317 three credits
Art of the Book
Prerequisites: Junior standing, any art major
Experimental approaches to bookmaking. Exploring conceptual attitudes will be combined with developing skills in bookbinding, papermaking, assorted printed processes and other related techniques.

DES 331 three credits
History of Design
3 lecture hours
A slide/lecture course covering the history of modern graphic design from the mid-1800s to the present. Aside from viewing the work, attention is given to the artists, their technical and esthetic contributions, and to the larger social, political and philosophical developments that are the content of this field.

DES 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

DES 196, 296, 396, 496 variable credit
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Calligraphy Courses

DES 213 three credits **C**
Calligraphy I
The fundamentals of letterform as a language system and its graphic implications. Projects emphasize the visual relationships of formal and informal letterforms as affected by natural rhythms, line shape, texture and the integration of images and decoration. This course is open to any student of the university.

DES 214 three credits **C**
Calligraphy II
Prerequisite: DES 213
Continuation of DES 213, an in-depth study of the five basic alphabet styles through design problems. This course is open to any student of the university.

DES 313 three credits
Calligraphy III
Prerequisite: DES 214
Continuation of DES 214, a study of lettering, type design, and calligraphy. This course is open to any student of the university.

DES 314 three credits
Calligraphy IV
Prerequisite: DES 313
Continuation of DES 313. This course is open to any student of the university.

Graphic Design Courses

DES 251 three credits **C**
Graphic Design I
Prerequisites: FOU 114, 115
An introduction to the basic principals and theories of color and icon development. Through a series of projects using traditional media, students explore these two fundamental design concepts. Note: Either DES 251 or 252 may be taken first.

DES 252 three credits **C**
Graphic Design II
Prerequisites: FOU 114, 115
An application of fundamental visual design concepts covered in FOU 115 to more specific concepts of communication design. Emphasis is placed on hierarchy, sequencing, and word-image relationships. Projects introduce both contemporary and traditional tools and techniques. Note: Either DES 251 or 252 may be taken first.

DES 351 three credits **C**
Graphic Design III
Prerequisite: DES 251, 252, 254
Communication design concepts are further explored with an emphasis placed on creating conceptually and formally complex compositions. Traditional contemporary and avant garde design strategies are explored. The importance of writing, research, and self-generated imagery is stressed as are the role of the designer in society and the role of the designer as author.

DES 352 three credits **C**
Graphic Design IV

Students attend all studios two hours weekly for each credit offered.

Prerequisites: DES 351, 353
An advanced-level course. Projects explore design strategies through an emphasis on information design and systems. Projects may be print or screen-based.

DES 451 six credits **E**
Graphic Design V
Prerequisite: DES 352
Students are encouraged to develop a personal approach to design, exploring their individual strengths, interests, and sense of self. Projects examine graphic design in a social context from an ethical perspective. As part of professional development, pragmatic problem solving issues are addressed such as off-set printing, resume building, and the design practice of estimating and billing.

DES 452 six credits **O**
Graphic Design VI
Prerequisite: DES 451
Students focus on their degree project which is a self-directed study that is both multi-dimensional—an ensemble of studies on formal and contextual concerns (inside and outside of design)—and consists of several pieces of work. Portfolio presentation is an integral part of this course, as are guest critics and lecturers. A minimum of two oral presentations are required.

Electronic Imaging Courses

DES 283 three credits **C**
Electronic Imaging I
Prerequisite: FOU 114, 115
Presents the skills necessary to construct complex and detailed drawings, illustrations, montages, and collages using the digital medium. Students experiment with color correcting and retouching of digitized images and are introduced to the range of effects associated with electronic imaging.

DES 284 three credits **C**
Electronic Imaging II
Prerequisite: DES 283
Continuation of DES 283.

DES 383 three credits
Electronic Imaging III
Prerequisites: DES 281, 284, 251, 254
Exploration in depth of the concepts of change, transformation, and visual rhythm. The student will be introduced to two dimensional computer paint and animation programs, image-processing technology as well as basic story-boarding. The history of animation and its relationship to other media will be explored through required readings and seminar style discussion. Students will produce a number of still and animated pieces.

DES 384 three credits
Electronic Imaging IV
Prerequisite: DES 383
Three-dimensional computer animation skills are the focus of this class. In-depth studies of natural forms and their associated motions will be emphasized along with discussions of time, space, color, and light. Storyboarding, lighting, and editing techniques will be introduced along with a variety of readings on the political and social role electronic media have played in contemporary society. Students will produce a number of short animations related to these technical areas as well as an in-depth final production.

DES 483 six credits
Electronic Imaging V
Prerequisite: DES 384
Professional skills for the construction of interactive multimedia presentations for CD-ROM and the Internet. Research, navigation, and interface design are emphasized. Central to the course is the development of technical proficiencies to author with image, text, animation, audio, and video. This course emphasizes the solving of a wide range of communication and technical problems as well as the development of each student's individual vision.

DES 484 six credits **O**
Electronic Imaging VI
Prerequisite: DES 483
Production by students of high-quality senior level projects and portfolios. Students may work in the areas of still imaging, animation, or interactive multimedia, or design for the Internet. The class includes exploration and presentations of professional opportunities in electronic imaging. The course also includes readings and discussion of politics and ethics of electronic media in contemporary society.

Photography Courses

DES 281 three credits **C**
Photographic Imaging I
A survey of the theory of black and white photography. Emphasis will be on darkroom experience, including the development of film, contact and enlargement printing. This course is open to any student of the university. It is a prerequisite for Electronic Imaging III.

DES 282 three credits **C**
Photographic Imaging II
Prerequisite: DES 281
Emphasis on development of digital photographic printing skills, professional presentation, and exploration of contemporary means of photographic expression. This course is open to any student of the university. It is a prerequisite for Electronic Imaging III.

DES 332 three credits **E, G, O**
History of Photography
3 lecture hours
Survey, through lecture and audio-visual presentation of the development of technical and aesthetic concerns in photography from its origins to the present. Special attention will be paid to the impact of historic events on the aesthetic considerations of the day. This course is open to any student of the university.

DES 381 three credits **W, O**
Photographic Imaging III
1 1/2 hour lecture, 3 hours laboratory
Prerequisite: DES 281, 283
The development of a personal approach to photography as well as application of techniques used in applied photography, integrated in a series of projects involving multiple image printing, use of high contrast film, and large format camera work. This course is open to any student of the university.

DES 382 three credits
Photographic Imaging IV
1 1/2 hour lecture, 3 hours laboratory
Prerequisite: DES 381
Continuation of DES 381 with further exploration of experimental techniques and their application to applied and personal photographic statements. A brief survey is made of the history of photography.

DES 385 three credits
Studio Photography
Prerequisite: DES 281
3 hours laboratory; studio demonstrations, print and slide presentation three hours
Professional methods of photographing two and three dimensional objects in black and white, and color. Lighting techniques utilizing daylight, quartz lights and electronic flash are studied. Film formats from 35 mm to 4x5 are used to produce prints and transparencies. Effective use of simple studio props is studied.

Students attend all studios two hours weekly for each credit offered.

DES 481 six credits
Photographic Imaging V
3 hours lecture, 6 hours laboratory
Prerequisite: DES 382
An intensive study of advanced techniques used in contemporary photography. Emphasis is placed on the development of a personal fine-arts photographic approach coupled with professional esthetic standards. This course is open to any student of the university.

DES 482 six credits
Photographic Imaging VI
3 hours lecture, 6 hours laboratory
Prerequisite: DES 481
Continuation of DES 481 with an emphasis placed on the preparation of a professional photographic portfolio. This course is open to any student of the university.

Illustration Courses

DES 221 three credits **C**
Illustration I
Prerequisites: FOU 110, 112
An introduction to illustration focusing on drawing and composition as they relate to the special needs of the illustrator; an exploration of the tools, techniques, and surfaces commonly used in illustration, with emphasis on black and white media.

DES 222 three credits **C**
Illustration II
Prerequisite: DES 221
Continuation of DES 221 focusing on color media, with an introduction to concepts for illustrators. The course also includes a review of procedures used in gathering reference material for illustration, and a slide survey of the history of illustration.

DES 321 three credits
Illustration III
Prerequisite: DES 222
Through specific projects, students are introduced to a wide range of specialized areas within the illustration field. This course also includes in-depth exploration of concepts for illustrators and slide surveys of both contemporary illustration and the work of fine artists who have influenced illustration.

DES 322 three credits
Illustration IV
Prerequisite: DES 321
Continuation of DES 321 with increasing focus on the student's individualized area of interests and the tools and techniques most appropriate to that area. This course also includes guest lecturers by professional illustrators.

DES 323 three credits
Fashion Illustration I
Prerequisites: FOU 110, 112
Learning to draw the fashion figure. Includes intensive drawing from clothed models, fashion photos and prototypes. Rendering skills to be developed by working from a wide variety of clothing and accessories as well as through experimentation with painting and illustrational techniques. Includes female, male and children's fashion illustration. Attention will also be given to the composition of the total fashion ad, with layout assignments dealing with the relationship of figure to type.

DES 324 three credits
Fashion Illustration II
Prerequisite: DES 323 or permission of instructor.
Continuation of DES 323.

DES 421 six credits
Illustration V
Prerequisite: DES 322
Students develop their individual strengths and interests to bring technical and conceptual skills to a professional level and to define a personal style. This course also includes projects which will result in printed work, and frequent guest lectures.

DES 422 six credits
Illustration VI
Prerequisite: DES 421
Continuation of DES 421. Each student designs and executes a long-term project in his or her particular area of interest in order to build a consistent, professional-level portfolio. Self promotion and business aspects of the illustration field are explored.

Typography Courses

DES 253 three credits **C**
Typography I
A survey of the development of our alphabet from ancient times to the present. Through a series of projects, students explore the anatomy of letterforms, the alphabet as a system, the evolution of type specification since the development of moveable type, and the continuing evolution of letterforms and lettermaking. Note: Either DES 253 and 254 may be taken first. Open to any student of the university.

DES 254 three credits **C**
Typography II
A concentrated study of type; its language, rules, and styles as a means of communication and as a tool for expression. Hierarchies and grids are introduced as methods for organizing written information. The course is divided between studio projects which explore the basic elements and structure of type, and the computer lab where more complex typographic projects are in introduced though InDesign. Scanning and printing procedures are reviewed. Note: Either DES 253 and 254 may be taken first. Open to any student of the university.

DES 353 three credits **C**
Typography III
Prerequisites: DES 253, 254
Projects emphasize the organization, hierarchy, and expressive use of typography. Assignments encourage students to explore both traditional and experimental approaches to using type while acquiring the knowledge and use of the finer points of typography.

DES 354 three credits **C**
Typography IV
Prerequisite: DES 353
An exploration of the tools and techniques used in a specialized area of classical and contemporary typography. Topic varies. Example topics include: letterpress and printmaking; time-based type; typeface design; communicating complex information through typography.

DES 453 six credits
Typography V
Prerequisite: DES 354
Continuation of DES 354

DES 454 six credits
Typography VI
Prerequisite: DES 453
Continuation of DES 453.

Ceramics Courses

DES 291 three credits **C**
Ceramics I
Clay as a material for making art. A variety of handbuilding and forming techniques will be explored through the context of making objects. Clay, slip, glaze, and various firing methods will be presented.

DES 292 three credits **C**
Ceramics II
The potter's wheel as the primary forming

Gen Ed Note

All Design courses satisfy Cultural/Artistic Literacy; lower division courses are marked **C**, but advanced courses are eligible as well. Some courses satisfy other requirements, as noted.

* Student majors are required to take the 300- and 400-level courses in their majors for six credits. Work will be adjusted accordingly.

tool in making pottery. Utility and function will be the primary intention, using the formed vessel as a means of expression. Clay bodies, slips, glazes, and firing methods will be presented.

DES 303 three credits
Ceramic Traditions
3 hours lecture
The individual artists and philosophies responsible for the development of 20th-century American studio ceramics. Contemporary ceramics and its relationship with technical, historical, and philosophical concerns will be presented.

DES 304 three credits
Clay and Glazes I
Prerequisites: DES 291, 292; or permission of instructor
Individual clays, clay body formulation, and engobes. Various physical properties of clay materials that determine color, firing temperature, and plasticity will be discussed, along with the formulation of specific clay bodies for a variety of forming methods and firing techniques.

DES 305 three credits
Issues and Criticism in the Ceramic Arts
Prerequisites: DES 291, 292; or permission of instructor
3 hours lecture
An exploration of the ways in which ceramic artists throughout history have used their medium to create a broad range of utilitarian and symbolic forms. The course will concentrate on the aesthetic principles inherent in the ceramic arts.

DES 306 three credits
Moldmaking
Prerequisites: DES 291, 292; or permission of instructor
The fundamentals, information, and skills necessary to make a variety of molds used in the ceramic process. The casting and forming methods available to ceramists through plaster and other materials will be explored.

DES 307 three credits
Clay and Glazes II
Prerequisites: DES 291, 292, 304; or permission of instructor
The physical properties of glaze materials used in the ceramic process. Through lectures and lab assignments, students will learn to translate technical information into visual and tactile objects while exploring glaze surface, color, and transparency.

DES 308 three credits
Kiln Building
Prerequisites: DES 291, 292; or permission of instructor
The information and skills necessary to design and build a variety of ceramic kilns. Discussion will include fuel sources, burner design, and combustion needs for these fuels, and how these factors affect kiln design.

DES 391 three credits
Ceramics III
Prerequisite: DES 292 or permission of instructor
Exploration of the many possibilities of clay. Students will develop a variety of ideas using handbuilding, wheel-thrown, and slip-cast molds as forming methods. Issues related to sculpture and their translation to the ceramics medium will be discussed.

DES 392 three credits
Ceramics IV
Prerequisite: DES 391
Using the technical knowledge acquired in previous semesters, students will develop a personal aesthetic direction. Students will be challenged to explore the large range of possibilities within the field of ceramics as it applies to their personal goals.

DES 491 three or six credits *
Ceramics V
Prerequisite: DES 392
Encourages advanced students to develop further their personal artistic vision, to be self-critical, and to challenge aesthetic concerns and concepts. Each student will present an oral report on a major artist who was influential in his or her development.

DES 492 three or six credits *
Ceramics VI
Prerequisite: DES 491
During this final semester, students develop and present a body of work in the form of a senior thesis. As part of this presentation, a 45 minute slide lecture is given, relating their artistic ideas, influences, work, and future goals.

Jewelry/Metals Courses

DES 293 three credits
Jewelry and Metals I
Prerequisite: Foundation courses for majors; no prerequisite for non-majors.
The basic properties and characteristics of metal. Projects involve learning to saw, form, fabricate, and finish various metals and will include simple stone settings.

DES 294 three credits
Jewelry and Metals II
Prerequisite: DES 293 for majors; permission of instructor for non-majors.
A more in-depth study of the properties and characteristics of metal through casting, moldmaking, etching, forging, and sinking shallow forms. Projects using cast forms, multiple elements, simple mechanisms, and functional utensils will be assigned.

DES 393 three credits
Jewelry and Metals III
Prerequisite: DES 294
Detailed study of holloware techniques with raising and seamed construction. Projects will be conducted using chasing/repousse, stone setting, aluminum anodizing, and more advanced mechanisms.

DES 394 three credits
Jewelry and Metals IV
Prerequisite: DES 393
Further exploration of metal form through machining methods, spinning, and electroforming. Projects of a more comprehensive nature will be conducted using previously-learned processes and techniques.

DES 395 three credits
Enameling
Prerequisite: DES 293 or permission of instructor
The techniques and processes for applying vitreous enamels to metal. Students will be expected to view enameling as a means for incorporating color into their existing knowledge of metalworking.

DES 493 six credits
Jewelry and Metals V
Prerequisite: DES 394
Senior-level metalwork requires the development of a contract plan for intensified, self-directed study in conjunction with the faculty. The student shall pursue building a body of work which extends technical proficiency and establishes a firm personal aesthetic.

DES 494 six credits
Jewelry and Metals VI
Prerequisite: DES 493
Continuation of contract plan study. The objective of the final semester is to complete a concise, cohesive body of work which will culminate with an exhibition

Gen Ed Note

All Design courses satisfy Cultural/Artistic Literacy; lower division courses are marked **C**, but advanced courses are eligible as well. Some courses satisfy other requirements, as noted.

Textile Design/Fiber Arts Courses

DES 273 three credits **C**
Weaving I: Off-Loom Constructions
Introduction to spinning of yarns from natural fibers using the drop spindle and spinning wheel, followed by simple natural dyeing processes and textile construction techniques such as twining, plaiting, card weaving, and basketry. Traditional world-wide use of these techniques will be discussed. Samples and projects of each technique are required.

DES 274 three credits **C**
Weaving II: Introduction to On-Loom Weaving
Weaving on the 4-harness floor loom. Design for weaving will focus on color, fiber and pattern investigation. Stripes, twills, color-and-weave techniques, and overshot patterns will be used for woven samples and inventive functional projects such as scarves, garments and rugs. Pattern drafting for weave structure notation will be done by hand on graph paper, and on computer with a CAD weave program.

DES 275 three credits **C**
Creative Weaving
For non-majors only
An *open university elective* to introduce weaving on the 4-harness floor loom. Patterns such as twills, plain weave, inlay, and other surface effects will be used in combination with a variety of fibers to produce samples and projects in the form of garments or other functional textiles.

DES 277 three credits **C**
Textile Design I: Introduction to Print and Dye Techniques
Introduction to fabric dyeing and printing techniques such as immersion dyeing, resist dyeing including batik and paste resist, block print and screen print. Use of dyes and dyelab equipment will be presented according to required health and safety guidelines. Samples of various technical experiments will be matted for presentation or logged in a research sketch book. Functional and non-functional formats will be explored for projects. Basic sewing machine techniques will be introduced.

DES 278 three credits **C**
Textile Design II: Introduction to Croquis and Repeats
Introduction to pattern design on paper including specific rendering techniques such as gouache painting, luma dye, and ruling pen and their use in the textile design industry. A categorized clippings source book of design and color ideas is compiled by each student. Projects include CAD color palette generation and gouache color matching, painted repeats, and needlework or quilt projects.

DES 309 three credits
Textile Styling
Prerequisite: Permission of instructor
Various subjects concentrating on traditional and on-traditional textile related construction techniques which may include sewing for garment, costume, and body adornment, or 3-dimensional sculptural forms.

DES 310 three credits
Resist Dyeing
Prerequisite: DES 277 or permission of instructor
Exploration of resist dyeing techniques with emphasis on Japanese and West African traditions and their application to contemporary textile expression. Course is open to students with basic understanding of surface design and dyeing, including majors and non-majors.

DES 370 three credits **G, O**
History of Textiles
A chronological survey of Eastern and Western world textiles from prehistoric times to the 20th century. Emphasis is on artistic, religious, socio-economic, technological, and political influences on textile development. Areas of study include textiles from Asia, Africa, India, Europe, and the Americas. Weekly quizzes are supplemented by research reports and an oral presentation.

DES 372 three credits **I**
Computer-Aided Textile Design
Open to all students
Exploration of computer design techniques for design generation and enhancement, using textile-specific software including NedGraphics and Monarch's Pointcarre. Students learn aspects of complex design in the print, software systems for the print, color palette and design coloring programs, as well as weave design, jacquard design and 3-D rendering, resulting in a portfolio of design work. Woven sampling on the computerized dobby loom is included.

DES 373 three credits
Weaving III
Introduction to multi-harness weave structures concentrating on dimensional surface effects, scale and color changes, and double weave techniques for imagery and layering. Focus is on the contrasting properties and characteristics of natural wool fibers and man-made fibers. Samples are matted for portfolio presentation. Major projects include upholstery products, functional woolens, or other textile object. A CAD system weave program is used for yarn design and pattern drafting.

DES 374 three credits
Weaving IV
Prerequisite: Permission of instructor
Multi-layering, dyed and painted warps, and supplementary warp and weft techniques for dimensional and compositional effects. Using eight to sixteen-harness looms students develop projects including functional objects and fiber art installations.

DES 375 three credits
Woven Imagery three credits
Prerequisite: Permission of instructor
Exploration of various techniques which allow images to be woven, including tapestry, double weave pick-up, dye, discharge, and paint. Course is open to students with a basic understanding of 4-harness weaving, including majors and non-majors.

DES 378 three credits
Textile Design IV: Screen Print on Fabric
Prerequisite: DES 272 or permission of instructor
The process of photographic silk screen printing for repeat pattern designs on fabric is used to develop printed textiles. A variety of fabric and dye types is used to explore repeat pattern ideas based on personal research and nature drawings. The CAD print program is used for color separation, repeat unit trials, and colorings. Individual repeat units are used for portfolio presentations. Final projects are in the form of printed yardage fabrics.

DES 476 three credits
Senior Fibers I: Fiber Art Thesis
Prerequisite: Permission of instructor
A body of work is developed to address current issues in fiber art. Traditional and ethnic surface design and dyeing techniques, such as shibori and indigo, are introduced as vehicles for artistic ideas. Students choose from a variety of print, dye, woven or mixed media techniques to solve each project. Technical samples are matted for inclusion in portfolio. Projects are prepared for formal graduation exhibition at the end of the spring semester.

DES 477 three credits
Textile Design V/Weaving V: Portfolio

Students attend all studios two hours weekly for each credit offered.

Prerequisite: Permission of instructor
The development of design work in print, paint, or weave with surface embellishment techniques for portfolio coordinates and collections. Sources include documentaries of historical and ethnic textiles, sources from nature, and conversational subjects. Idea-boards are created to develop design sources for CAD print, weave, and jacquard projects culminating in a major portfolio review at the end of the semester.

DES 478 three credits
Textile Design VI/Weaving VI: Portfolio
Prerequisite: Permission of instructor
Continuation of work concentrating on the development of design work in print, paint, or woven media with significant additional work in needlework and surface embellishment techniques for portfolio coordinates. Design sources including florals, historical and ethnic subjects are explored. CAD programs are used to generate or enhance personal ideas in the development of the final portfolio for formal review by a visiting designer.

DES 479 three credits
Senior Fibers II: Fiber Art Thesis
Prerequisite: Permission of instructor
Students develop a body of work in various fiber art media describing a personal style and aesthetic. Sources of inspiration include historical and contemporary textiles. Projects range from site specific installations to innovative functional objects. Work is prepared for formal graduation exhibition to be held at the end of the semester.

Wood/Furniture Design Courses

DES 201 three credits **C**
Wood/Furniture Design I
3 studio hours
Introduction to wood as a material and the proper use of hand tools and woodworking machinery, focusing on box construction techniques and appropriate joinery techniques.

DES 202 three credits **C**
Wood /Furniture Design II
Continuation of DES 201 focusing on table construction techniques and simple finishing methods.

DES 301 three credits
Wood/Furniture Design III
Prerequisite: DES 202 or permission of instructor
An intermediate-level course focusing on furniture design concepts and construction methods, including carcase and frame techniques.

DES 302 three credits
Wood/Furniture Design IV
Prerequisite: DES 301 or permission of instructor
Continuation of DES 301, focusing on chair-making techniques from both a conceptual and a traditional viewpoint.

DES 401 six credits
Wood/Furniture Design V
Prerequisite: DES 302
An advanced-level course continuing practices in furniture design concepts and construction methods, focusing on large-scale furniture projects, and emphasizing the use of plywood and related fabricated material, veneering techniques, and advanced finishing methods—as well as the design applications appropriate to these processes.

DES 402 six credits
Wood/Furniture Design VI
Prerequisite: DES 401
Continuation of DES 401. Lectures and presentations will address issues in professional practice. Upon acceptance of a project proposal, students present a body of work in the form of a senior thesis.

Fine Arts

The Department of Fine Arts' mission is to maintain an environment where artists are committed to the pursuit of teaching, research, and creative work. As a faculty of professional artists, we provide a high-quality studio education to students at the foundation, undergraduate, and graduate levels through formal, aesthetic, technical, and intellectual training. We prepare our students to become creative artists, pursue graduate study, or engage in Fine Arts related professions by granting the BFA and MFA.

Our goals are:

- to prepare students to become professional practitioners in the disciplines of painting, printmaking, or sculpture, as well as equip them for other art-related careers, by offering high quality education and training in the visual arts
- to give students a thorough understanding, appreciation, and competence in drawing from life through a rigorous four-year drawing requirement which emphasizes and underscores the importance of drawing skills as universal to all visual arts disciplines
- to encourage students to pursue their personal directions in art, based on a firm grounding in the fundamentals of their field
- to provide those students who wish to continue their education at the graduate level with qualifications for entry and the values which will contribute to their success
- Our ultimate objective is to develop respect for learning and the creative act, to enable our graduates to contribute to human culture with confidence and authority.

Faculty and Fields of Interest

Richard J. Creighton sculptor

Alma Davenport photography, printmaking

Willoughby R. Elliott painter, printmaker

Severin Haines painter

Laurie Kaplowitz painter

Anne Leone painter

Eric Lintala sculptor

Bryan McFarlane painter

Anthony J. Miraglia painter

Marc St. Pierre (chairperson) printmaker/photographer

Stacy Latt Savage sculptor

Kurt Wisneski printmaker

Majors in Painting/2D Studies and Sculpture/3D Studies BFA degree

The Department of Fine Arts offers two majors: Painting/2D Studies and Sculpture/3D Studies. Students who choose one of these disciplines enter a rigorous, four-year program. As its foundation, each major has a structured, sequential drawing requirement which provides a rich visual vocabulary and a basis for visual problem solving. The department teaches the fundamental principles and skills of each discipline, enabling students to acquire the knowledge needed to produce a coherent, personal body of creative work.

Painting/2D Studies and Sculpture/3D Studies students have space, facilities, and equipment which places the programs among the more desirable ones in the country. Juniors and seniors work in private studio areas. Each student receives individual attention from faculty committed to teaching excellence as well as the critical support that comes from working within a group. Students know that their instructors are active and respected artists who bring first-hand, up-to-date knowledge to their studios. Academic excellence is recognized annually by department and college awards.

Fine Arts also has an active Visiting Artist Program that brings well-known artists to the university on a regular basis to discuss their work, conduct workshops, and assess developments in the art world. The Department and College host or participate in many on and off-campus exhibitions. These experiences prepare students to enter the competitive, exciting world of the visual arts with confidence.

Requirements for Painting/2D Studies and Sculpture/3D Studies Majors

		Semester Credits First	Second
First Year			
FOU 101, 102	Visual Arts Colloquium	1	1
FOU 110, 112	Foundation: Structural/Life Drawing	3	3
FOU 114, 115	2D Workshop/Visual Language	2	2
FOU 124, 125	3D Concepts/3D Workshops	2	2
ARH 125	Visual Culture: Renaissance to Modern Art	3	
ARH 150	Visual Culture: Modern to Contemp. Art		3
ENL 101, 102	Critical Writing and Reading I, II	3	3
	Non-Studio electives	3	3
		17	**17**
Second Year			
FIA 221, 222	Figure Drawing I, II	3	3
ARH 200	Visual Culture: Ancient, Medieval, World Art	3	
	Major Studios	3	3
	Studio Support*	3	3
	Gen Ed E, D, or G/Hum or Soc Sci elective		3
	Gen Ed D, G, W/Literature elective	3	
	Studio/Free Elective		3
		15	**15**
Third Year			
FIA 321, 322	Figure Drawing III, IV	3	3
FIA 311	Composition and Design		3
	Major Studios	6	3
	Studio Elective	3	
	Gen Ed/Natural Science Elective		3
	Art History Elective	3	
	Mathematics elective		3
		15	**15**
Fourth Year			
FIA 421,422	Drawing V	3	
	Major Studios/Visual Thesis	6	3
FIA 400	Senior Seminar	3	
	Gen Ed E, D, or G/Hum or Soc Sci elective	6	
	Gen Ed/Natural Science Elective		3
	Studio Elective **OR** Free Elective		3
	Free Elective		3
		18	**12**
	Total credits:		**124**

General Education Departmental Requirements

Students majoring in a Fine Arts major will meet their departmentally-controlled General Education requirements as follows:

Area E: Satisfied by any course from the approved list of Area E courses
Area I, Tier 2: Satisfied by FIA 400
Area W, Tier 2: Satisfied by ARH 200
Area O: Satisfied by FIA 341, FIA 381, or FIA 391

Specific Requirements for the Different Majors

All Fine Arts Majors are required to take one 300-level Art History elective in addition to the ARH 125, 150, and 200 requirements. Students are urged to take as much Art History as possible or an Art History Minor.

***Studio Support: Painting/2D Studies Majors:** are required to take one 200-level sculpture course and one 200-level printmaking course.

***Studio Support: Sculpture/3D Studies Majors:** are required to take one 200-level painting course and one 200-level printmaking course.

Studio Electives
Credits are fulfilled by taking studio courses offered by the following departments; Art Education, Design, and Fine Arts.

Free elective
Any course will satisfy this requirement.

Students attend all studios two hours weekly for each credit offered

Fine Arts Courses

FIA 221, 222 three credits each **C**
Figure Drawing I, II
Prerequisites: FOU 110, 122
The human figure, its form, mass, and proportions, is studied in relation to its environment. Live models are used.

FIA 223, 224 three credits each **C**
Nature Drawing I, II
Prerequisite: FOU 112
Problems in drawing based on direct observation of flowers, plants, and other natural forms.

FIA 225 three credits **C**
Object Drawing I
Prerequisite: FOU 112
Explores a variety of problems involved in drawing natural as well as artificial objects and perspective.

FIA 241, 242 three credits each **C**
Painting I, II
Prerequisite: FOU 112
This is an introductory course in beginning painting. The technique of oil is predominant; however, other plastic media are also considered. Concepts of design, composition, and color are studied. The development of the intuitive and creative ability of the individual is given careful attention.

FIA 243 three credits **C**
Watercolor
An introduction to the medium of water color from initial conception to final image. There will be intensive personal experimentation with techniques.

FIA 281 three credits **C**
Printmaking I: Silkscreen
Corequisites: FIA 221, 241
A studio course in silkscreen, in which various stencil-making processes will be introduced. Color and shape relationships, as well as artistic values and techniques will be stressed.

FIA 283 three credits **C**
Printmaking I: Intaglio
Prerequisites: FOU 110, 112
A studio course in the techniques of intaglio. Artistic values as well as techniques will be stressed.

FIA 284 three credits **C**
Printmaking I: Etching
Prerequisites: FOU 110, 112
A studio course in the techniques of etching. Artistic values as well as techniques will be stressed.

FIA 285 three credits **C**
Printmaking I: Lithography
Prerequisites: FOU 110, 112
An introduction to the printmaking process of lithography on stone, and aluminum plate. The development of artistic values as well as technical facilities will be stressed.

FIA 286 three credits **C**
Printmaking II
Prerequisites: FOU 110, 112
Continuation of sophomore studies in printmaking (etching and lithography). This course builds on first semester lithography and etching printmaking and applies that basic knowledge on advanced concepts.

FIA 287 three credits **C**
Printmaking: Monotype
Prerequisites: FOU 110, 112
A studio course exploring the monotype, or unique print, that applies artistic aesthetics in making painterly prints.

FIA 288 three credits **C**
Photo Processes and Printmaking
Prerequisites: FOU 101, 112, 114, 115
Methods of image-making and producing multiples using non-silver processes. Students will explore the use of positive and negative transfer materials affecting non-silver print processes and will be expected to expand upon the problems introduced in traditional photography and printmaking classes. No camera required.

FIA 291 three credits **C**
Sculpture I
Prerequisite: Sophomore art major standing, or permission of department
A structured introduction to basic techniques including clay modeling from the figure, used of plaster, wood, welding, mold making, and casting. The course should enable the beginning student to explore media and gain fundamental skills with them. Content, form and technique are discussed in relation to the work.

FIA 292 three credits **C**
Sculpture II
Continuation of FIA 291.

FIA 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing, permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

FIA 300 three credits
Advanced Color Theory
Prerequisites: FOU 114, 115
This studio course discusses the work of major color theorists and applies their theories in a series of class assignments. The course proceeds with regular weekly lectures illustrated by slides and reproductions. All classwork is reviewed in weekly critiques. The theorists discussed include Munsell, Ostwald, Itten, Albers and others. Also discussed are structural usage of color, color psychology, color history, color in modern art and the various color media.

FIA 310 three credits
Visual Language of Art
3 lecture hours
Provides the student with a basis for evaluation of paintings and sculpture through the use of slides, basic problems, lectures, and discussions.

FIA 311 three credits
Composition and Design
Prerequisites: FIA 222, 242
An advanced consideration of design principles is applied to weekly assigned drawing problems. Resourcefulness in technical treatment and imaginative approach are encouraged.

FIA 321 three credits
Figure Drawing III
Prerequisite: FIA 222
Continuation of Figure Drawing I with more attention given to composition and individual approaches. New techniques and media are introduced.

FIA 322 three credits
Figure Drawing IV
Continuation of FIA 321.

FIA 341 three credits **O**
Painting III
Prerequisites: FIA 222, 242
Intermediate painting problems related to the individual, aimed at improving the student's ability to compose in a professional manner. The student works from the figure, nature, and still life with an emphasis toward his/her personal development.

FIA 342 three credits
Painting IV
Continuation of FIA 341.

Gen Ed Note

All Design courses satisfy Cultural/Artistic Literacy; lower division courses are marked **C**, but advanced courses are eligible as well. Some courses satisfy other requirements, as noted.

FIA 380 three credits
Relief Printmaking
Construction of images by printing from various surfaces. Traditional woodcuts are featured as well as experiments with other possibilities of "Relief Type" surfaces.

FIA 381 three or six credits* **O**
Printmaking III
Prerequisites: FIA 222, 281, 283, 285
A studio course aimed at developing a high degree of technical articulation with printmaking techniques of the students' choice as they relate to the image making process.

FIA 382 three or six credits*
Printmaking IV
Continuation of FIA 381.

FIA 391 three or six credits* **O**
Sculpture III
Prerequisite: FIA 292
A course designed for those having a deeper interest in sculpture. Intended to deepen and refine skills in one or more media. The beginning of the student's development of a sculptural idea in an open workshop. Students who are majoring in sculpture can register for six (6) credits. The work required will be adjusted accordingly.

FIA 392 three or six credits*
Sculpture IV
Continuation of FIA 391.

FIA 400 three credits **I**
Senior Seminar
3 lecture hours
Prepares the student in Fine Arts for the field they will be entering. The course deals with portfolio preparation, resumes, contracts, and the business aspects of the art world.

FIA 421 three credits
Drawing V
Six studio hours
Prerequisite: FIA 322
A drawing course intended to help the student correlate previous drawing experiences. More emphasis is placed on individual expression and interpretation.

FIA 422 three credits
Drawing VI
Continuation of FIA 421.

FIA 441 three or six credits*
Painting V
Prerequisite: FIA 342
Advanced problems in painting with emphasis on personal development. There are individual criticisms and seminar discussions of contemporary problems in painting.

FIA 442 three or six credits*
Painting VI
Prerequisite: FIA 441
Continuation of FIA 441 with the student gradually working more independently. Criticisms applied even more on an individual basis.

FIA 481, 482 three or six credits each*
Printmaking V, VI
Prerequisite: A minimum of 15 credits in printmaking
An advanced studio course in printmaking aimed at the further development of a professional attitude toward the printmaking techniques as a means of artistic statement.

FIA 491 three or six credits*
Sculpture V
Prerequisite: FIA 392
A studio course stressing individual concentration with sculptural media and processes for the advanced student. Students who are majoring in sculpture can register for six (6) credits. The work required will be adjusted accordingly.

FIA 492 three or six credits*
Sculpture VI
Continuation of FIA 491. Students who are majoring in sculpture can register for six (6) credits. The work required will be adjusted accordingly.

FIA 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

FIA 196, 296, 396, 496 variable credit
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

FIA 498, 499 three credits each
Special Topics in Sculptural Materials and Techniques I, II
Prerequisites: FIA 291 and 292, or permission of instructor (majors); permission of instructor (non-majors)
An in-depth exploration of a specific sculptural concern. A single topic will be offered each semester. Special topics include Bronze Casting, Aluminum Casting, Stone Carving, Installation/Performance Art, The Figure, Cast Paper, and Site-Specific Sculpture.

***Note:** Student majors are required to take any of the 300- and 400-level courses in their majors for six credits. Work will be adjusted accordingly.

Note: Undergraduates may not take graduate courses. See the *Graduate Catalogue* for graduate general and program requirements.

Graduate Artisanry, Fine Arts, and Visual Design Courses (MFA Program)

ART 505 three credits
Graduate Seminar I
Forum for exploring contemporary art and design issues and learning from peers about developments in various art fields. Representative critical writings are discussed.

ART 506 three credits
Graduate Seminar II
Continuation of ART 505.

Art 507 three credits
Fine Arts Symposium
Integrates the beginning Fine Arts graduate student into the studio program, deepening and enriching awareness of personal direction, and introduces the greater art community and issues of the professional artist. Students periodically present and discuss their work, guest critics discuss and evaluate their work, and professional artists make presentations in their studios. The course also presents professional topics such as grant writing, studio space, business, and bookkeeping. Required of Fine Arts MFA students; takes the place of an elective.

ART 512 six credits
Visual Thesis
The preparation of a body of conceptually focused, original, and innovative visual work for exhibition or presentation. Graded A-F.

ART 515 three credits
Writing Seminar
Organizational tools for thesis preparation, with analysis of content and style of theses by recent graduates and other writings. Writing begins with a revision of the thesis proposal as the introduction to the thesis. A preliminary draft is prepared by the end of the semester. Significant class time is devoted to group critiques of student writing.

ART 516 three credits
Written Thesis
The completion of the written thesis, a verbal explanation of the visual thesis which includes research of sources and a discussion of pertinent aesthetic issues, materials, and processes. Graded A-F.

ART 520 three credits
Philosophy of Art
Themes to be discussed include the nature of form and expression in art, the similarities and differences between the artist's relation to the work of art and the spectator's, the difference between linguistic and visual arts, and the social function of art. The works of a few major philosophers will be compared to demonstrate alternative points of view.

ART 531 three credits
On Creativity
Basic patterns of conscious and unconscious information processing underlying artistic, humanistic, and scientific inspiration, discovery, and invention.

ART 590 three credits
Instructional Development
Provides fundamental knowledge needed to develop course content, curriculum, and project planning for studio classes taught in the foundation program.

ART 595 variable credit
Independent Study
Prerequisite: Permission of instructor, graduate director, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

ART 596 variable credit
Directed Study
Prerequisite: Permission of instructor, graduate director, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Graduate Major and Elective Studios

The major studios involve intensive work and research in the student's area of concentration. Students investigate the aesthetic, conceptual, technical, and structural properties of chosen media through an individualized study program developed under the guidance of their major advisors. Through questioning and experimentation, students are expected to consolidate technique with the development of strong, expressive ideas. Informal critiques and individualized discussions are scheduled.

Graduate Studio I nine credits each as major studio
Prerequisite: Permission of Instructor
The studios listed are major or elective studios depending on the student's identified major option, the course, and the number of credits chosen. A student typically takes 9 credits in the major studio and 3 credits as an elective in another studio. Independent study (ART 595) or Directed Study (ART 596) may also be used for elective work.

ART 501 Graduate Studio I: Wood/ Furniture Design
ART 521 Graduate Studio I: Drawing
ART 523 Graduate Studio I: Illustration
ART 533 Graduate Studio I: Sculpture
ART 541 Graduate Studio I: Painting
ART 551 Graduate Studio I: Graphic Design
ART 553 Graduate Studio I: Typography
ART 573 Graduate Studio I: Fibers
ART 581 Graduate Studio I: Photography
ART 583 Graduate Studio I: Electronic Imaging
ART 585 Graduate Studio I: Printmaking
ART 591 Graduate Studio I: Ceramics
ART 593 Graduate Studio I: Metals/ Jewelry

Graduate Studio II nine credits each as major studio
Prerequisite: Permission of Instructor
Continuation of major and elective studios.

ART 502 Graduate Studio II: Wood/ Furniture Design
ART 522 Graduate Studio II: Drawing
ART 524 Graduate Studio II: Illustration
ART 534 Graduate Studio II: Sculpture
ART 542 Graduate Studio II: Painting
ART 552 Graduate Studio II: Graphic Design
ART 554 Graduate Studio II: Typography
ART 574 Graduate Studio II: Fibers
ART 582 Graduate Studio II: Photography
ART 584 Graduate Studio II: Electronic Imaging
ART 586 Graduate Studio II: Printmaking
ART 592 Graduate Studio II: Ceramics
ART 594 Graduate Studio II: Metals/ Jewelry

Graduate Studio III three credits each
Prerequisite: Permission of Instructor
Final major studio/continuation elective studio.

ART 601 Graduate Studio III: Wood/ Furniture Design
ART 621 Graduate Studio III: Drawing
ART 623 Graduate Studio III: Illustration
ART 633 Graduate Studio III: Sculpture
ART 641 Graduate Studio III: Painting
ART 651 Graduate Studio III: Graphic Design
ART 653 Graduate Studio III: Typography
ART 673 Graduate Studio III: Fibers
ART 681 Graduate Studio III: Photography
ART 683 Graduate Studio III: Electronic Imaging
ART 685 Graduate Studio III: Printmaking
ART 691 Graduate Studio III: Ceramics
ART 693 Graduate Studio III: Metals/ Jewelry

Music

The Bachelor of Art in Music program offers a comprehensive major that contains a core curriculum of music theory, music history, musicianship, and functional piano and provides exposure to performance. Students in this major may decide to gain additional, specialized music exposure by selecting one of a number of options. This program represents a substantial restructuring of previous offerings.

Options are offered in
- Music Education (leading to teacher certification)
- Music Technology
- Western Music
- World Music/African American Music.

In addition, the department offers two Music minors: the Minor in Music that has applied and non-applied emphases, and a new minor in Music Therapy.

Graduates of the major program have a variety of avenues open to them, from teaching and performing to electronic music (composition, sound design, and audio recording), advanced study, and careers in related fields. The department urges its students to develop interdisciplinary programs with other university departments.

The Music Department sponsors a Guest Artist Recital Series, a Faculty Recital Series, a Guest Artist Lecture Series, and many student ensemble and solo recitals. A collaborative program with the New Bedford Symphony Orchestra permits qualified students to play with the orchestra and to participate in their outreach programs.

Faculty and Fields of Interest

James Bohn electronic music, theory

Eleanor Carlson (chairperson) piano, music history

royal hartigan ethnomusicology, world music

John Laughton (dean of the college) clarinet, theory, music history

Adjunct and Part-Time Faculty

Todd Baker bass, jazz studies, contemporary ensemble

Annette Betanski classical voice

Richard Britto saxophone, jazz studies

Wayman Chin piano, music skills

Hyunjang Choi harp

Paul Cienniwa music history, music skills, harpsichord, organ

Justin Cohen French horn

Jamie Eckert percussion, percussion methods, percussion ensemble, pep band

Emmanuel Feldman cello

Marcel Gauvin jazz voice

Tim Harbold chorus, Spinners vocal ensemble and gospel choir

John Harrison jazz piano, jazz studies, jazz ensemble

William Kingsland trombone, tuba, brass methods

Semenya McCord jazz studies, jazz voice, vocal ensemble

Andy McWain jazz studies

Tim Meldinger theory, orchestration

Tobias Monte wind ensemble, conducting, brass methods

Charlene Monte string methods

Jane Murray oboe

Marie Nelson music education, class piano

Eliot Porter double bass

Will Riley classical guitar, music skills

Wendy Rolfe flute

Kareem Roustom music technology

Issi Rozen jazz guitar, guitar ensemble

Lisa Rue music therapy

Charles Sherba violin, chamber ensemble

Consuelo Sherba viola

Sissie Wun Sze Siu classical saxaphone, woodwind methods

Rieko Tanaka staff accompanist

Susan Wood bassoon

Music Major BA Degree

Requirements

Entrance to the Major
All candidates must pass an entrance audition and take an advisory exam to determine their potential and background in music. Candidates are expected to have some facility on their instrument and to have some preparation in fundamental concepts of music theory.

Distribution/Gen Ed Requirements
Music majors are subject to the General Education requirements and to the following distribution requirements:

Six credit hours in a foreign language. Credits may be taken in Italian, French, or German (two semesters in the same language)

Six credits in Western Civilizations or World Civilizations (HST 101, 102 or HST 103, 104).

Twelve additional credits from courses outside of the Music department.

Students majoring in Music will meet their departmentally-controlled General Education requirements as follows:

Area E and M: Choose from lists of approved courses
Area I, Tier 2: MUS 128, 129, 271, 272
Area W, Tier 2: MUS 203, 204
Area O: MUS 203, 204

The base major requires 52 credits of MUS courses; students who elect an option will add from 12 to 16 additional credits to that number (26 for teaching). Students not electing an option will have 12 free electives. The degree program remains at 120 total credits except for those doing teaching.

		Semester Credits	
First Year		**First**	**Second**
MUS 128, 129	Intro to Music Technology I, II	1	1
MUS 171, 172	Theory I, II	3	3
MUS 109, 110	Music Skills I, II	2	2
MUS 165, 166	Class Piano I, II	1	1
MUS	Applied Instrument/Voice	1	1
MUS	Ensemble	1	1
MUS 291	Performance Workshop	0	0
ENL 101, 102	Critical Writing and Reading I, II	3	3
HST 101, 102	History of Western Civ. I, II **OR**	3	3
HST 103, 104	History of World Civ. I, II		
		15	**15**
Second Year			
MUS 271, 272	Theory III, IV	3	3
MUS 209, 210	Music Skills III, IV	2	2
MUS 203, 204	Survey of Western Music	3	3
MUS	Applied Instrument/Voice	1	1
MUS	Ensemble	1	1
MUS 291	Performance Workshop	0	0
	Gen Ed Math/Free Elective[1]	3	3
	Free Electives[1]	1	1
		14	**14**
Third Year			
MUS 242	Survey of African American Music	3	
MUS 372	Music in World Cultures		3
MUS	Applied Instrument/Voice	1	1
MUS	Ensemble	1	1
MUS 291	Performance Workshop	0	0
	Language Elective[2]	3	3
MUS	Music Option/Free Electives[3]	3	3
	Free Electives	6	6
		17	**17**
Fourth Year			
MUS	Applied Instrument/Voice	1	1
MUS	Ensemble	1	1
MUS 291	Performance Workshop	0	0
	Gen Ed Ethics	3	
	Gen Ed Science/Tech[4]	3	3
MUS	Music Option/Free electives[3]	3	3
	Free Electives	3	6
		14	**14**
	Total credits:		**120**

1
Music Education students should enroll in Child or Adolescent Psychology for their free elective.
2
All Music Majors are required to study a language other than English. Specific language areas are determined by advisement and relevance to a student's concentration. One full year of a chosen language is necessary and may be taken at the 100-level.
3
Courses and requirements for each junior/senior year Option are taken here; students not completing an Option may select free electives.
4
It is recommended that students enroll in PHY 261, Physics of Music.

Options for the Music Major

All Music BA candidates will follow the four-year common curriculum. Students who wish may also select one of the four music options, which will be noted on diplomas and academic transcripts. Students who do not wish to complete an option will replace the courses listed as "Music Concentration" courses with free electives.

Western Music Option
Select 12 credits from the following courses:

MUS 219, 220	Foreign Language Diction*	(2)
MUS 265/266	Class Piano III, IV	2
MUS 313	Orchestration	3
MUS 340	Principles of Conducting	2
MUS	Music History (period courses)	up to 6
MUS 335, 336, 435, 436	Composition Lessons (1 credit each semester in both junior and senior years)	4
MUS 412	Form and Analysis	3
	Total Selected:	**14 (16)**

*Additional credits required for music majors studying applied voice.

Music Education Option
See next page.

World Music/African American Music Option
Select 12 credits from the following courses

MUS 371	Topics in World Music (the Americas, European-non art music, the Middle East, Africa, Oceania, Asia, India)	up to 9
MUS 370	Music and Culture of African Diaspora	3
MUS 311, 312	Jazz Piano I, II	2
MUS 314, 315	Jazz Improvisation I, II	6
MUS 318	Jazz Arranging	3
	Total Selected:	**12**

Music Technology Option
Complete 12 credits from the following courses, as specified:

All students complete the following course:

MUS 223	Electronic Music Studio Techniques I	3

Students select three of the following courses: at least 9

MUS 322	MIDI Composition Techniques
MUS 323	Scoring for Video
MUS 324	Synthesizer Programming Techniques
MUS 325	Recording Techniques
MUS 341	Synthesizer Performance I
MUS 343	Electronic Composition I (one credit course)
MUS 345	Sound Production I

Total Selected: 12

Music Education Option

Each of the following must be taken. This curriculum qualifies the student for teacher certification, after the student completes the EDU 415/416 and 416/417 student teaching requirement, which can be done after graduating. Note that students must meet certain requirements to enter the student teaching preparation curriculum and to remain active in it; these are stated below.

Music Courses and Requirements

MUS 215,216, 217, and 218	Instrumental Methods Sequence	4
MUS 265,266	Class Piano III, IV	2
Sophomore Workshop	A non-credit experience required before the Music Education student takes MUS 316 and 317: field observations in schools with on-campus seminar discussions	
MUS 316	Teaching Children Music	3
MUS 317	Teaching Music in Secondary Schools	3
MUS 340	Principles of Conducting	2
MUS 313	Orchestration	3
MUS 412	Form and Analysis	3
MUS	Music History (two period courses)	6
	Total Required	**26**

Other Courses

PSY	Child or Adolescent Psychology	3
EDU 414, 416 **or** 415, 417	Student Teaching Practicum/Workshop (may be completed after the student graduates)	15

Other Requirements

The Music Department is approved by the Commonwealth of Massachusetts to offer Certification in Music Education at both the elementary level (grades PreK-9) and the secondary level (grades 5-12). Reciprocal agreements allow this certification to be valid in many states in addition to Massachusetts. This program is open to all qualified baccalaureate music majors. It is also available to individuals with degrees who wish to gain certification in music education.

Requirements to enter and remain active in the student teaching preparation curriculum leading to provisional certification with advanced standing:

- An interview with the Department Chairperson.
- Formal acceptance into a UMass Dartmouth degree program or possession of an appropriate BA or BS degree.
- A cumulative grade point average of 2.75. (A GPA of 2.5 will qualify for probationary status, and the Department will consider students with less than a 2.5 GPA if there are bona fide extenuating circumstances. A formal appeal process has been instituted for this purpose.)
- Pass the Communication and Literacy Skills Test (CLST) of the Massachusetts Test of Educator Licensure (MTEL) as an entrance requirement for this option.
- Pass the Music Content Area test of the MTEL as a prerequisite to student teaching.

Statistics about our student teaching program and state teacher test results are shown at the end of the chapter on "Interdisciplinary Programs." Program requirements will be revised to reflect on-going developments in state regulations and educational reform.

Music Minors

Music Minor (General)

The Music minor is available to all UMass Dartmouth students who meet the university requirement of a 2.5 grade point average and meet the Music Department entrance requirements. The program is designed for talented students who desire an opportunity to develop their musical abilities. It will also allow students who are seeking an eventual major in music to begin serious study in a challenging atmosphere.

Students may choose an area of concentration such as applied studies (piano, voice, flute, etc.), theory, or jazz studies. Each student's program is then built around this area of concentration in consultation with a departmental advisor. In addition, certain basic courses are required of all students. Students demonstrating a special ability or interest may, with approval of the full music faculty, develop individualized programs through independent study. Graduating seniors who have successfully completed the music minor will have this fact stated on their official transcripts.

Applied Emphasis
For students whose area of concentration is piano, voice, or orchestral instruments.

		Credits
MUS 171, 172	Theory I, II	6
MUS 203, 204	Survey of Western Music I, II	6
MUS 165-166	Class Piano I, II	2
MUS	Applied Voice/Instrument	4
MUS	Electives	6
	Total	**24**

Students with an applied-emphasis minor must participate in at least one student recital, which must be scheduled with the approval of the applied instructor. They are also required to participate in a major ensemble during at least one semester.

Non-Applied Emphasis
For students whose area of concentration is jazz studies or theory.

		Credits
MUS 171, 172	Theory I, II	6
MUS 203, 204	Survey of Western Music I, II	6
MUS 165-166	Class Piano I, II	2
MUS	Applied Voice/Instrument	2
MUS	Music Concentration**	9
	Total	**25**

** Jazz concentration minors must include Jazz Theory and Improvisation for three credits and African-American Music for three credits. Theory concentration minors must include MUS 271 and MUS 272 for six credits.

Music Therapy Minor

The Music Therapy minor is available to all UMass Dartmouth students who meet the university requirement of 2.5 grade point average and meet the Music Department entrance requirements. The program is designed for students who are interested in the therapeutic applications of music and majoring in related fields, such as education, nursing, geriatrics, and psychology. Students will be placed in appropriate core music courses based on their entrance examinations. Graduating seniors who have successfully completed the music therapy minor will have this fact stated on their official transcripts.

MUS 171, 172	Theory I, II	6
MUS 165, 166	Class Piano I, II	2
MUS	Applied Instrument/Voice	2
MUS 117	Class Guitar I	1
MUS	Music History Survey*	3
MUS 205	Introduction to Music Therapy	3
MUS 305	Activities in Music Therapy	3
MUS 307	Practicum in Music Therapy	3
MUS 405	Topics in Music therapy	3
	Total	**26**

*May be chosen from MUS 203, 204 Survey of Western Music, MUS 242 Survey of African American Music, or MUS 372 Music in World Cultures

Other Requirements and Information

Minimum Acceptable Course Grades/ Progress Requirements

The Music Department requires a minimum acceptable grade of C (2.000) in each music course that will be included in fulfillment of music major and minor requirements. Students wishing to pursue Music Education Certification must maintain a 2.700 grade point average and receive at least a B- in each required music course.

Students will have their progress monitored by the music department faculty in semester-end juries. Information on these criteria and other departmental regulations is available from the department office.

Music and the Business Minor

Students interested in music management or other aspects of the music industry may enroll in the Business Minor program. Details on the various business options are available from the Music Department or from the Business College. (See requirements and courses under the College of Business.)

Senior Project

Each student is required to complete a senior project (0 credits) prior to graduation within a course taken in the senior year. This should take a form relevant to the course of study—performance, recital, composition, research document/thesis, or other medium—, selected in consultation with a faculty advisor.

Study Abroad

Students are encouraged to pursue fieldwork study and research abroad in a culture relevant to area of concentration. This work may fulfill specific course requirements with prior approval. All study abroad should be planned in consultation with your faculty advisor and the music department chairperson.

Courses from Cognate Fields

It is recommended that students select electives from outside the Music Department. Electives may be chosen in relevant disciplines, such as African or African-American studies, Anthropology, Computer and Information Science, or Electrical and Computer Engineering.

Courses Primarily for Non-Majors

MUS 101 three credits **C, G**
Introduction to Music I
Presents a basic music vocabulary and develops intelligent discrimination in the listener through study and analysis of outstanding works from Gregorian Chant to the present, including music of diverse cultures. Emphasis is also placed on the relationship of the historical development of music to parallel movements in art, drama, philosophical thought, etc.

MUS 102 three credits **C**
Introduction to Music II
Continuation of MUS 101.

MUS 103 three credits **G**
Introduction to World Music
Explores the musical traditions of various cultures with respect to their historical, social, and cultural backgrounds. This course also explores different approaches to musical organization, musical practice, and significant aspects of style within a world music setting.

MUS 106 three credits **C, D**
Art of Rock: History of Rock Music
Multicultural sources of rock, examined through text-related lectures, listening to recordings, and viewing documentary videos. As an overview for non-music majors, the course is intended to broaden students' socio-cultural perspectives. The diversity of American popular music offers a direct reflection of, and at times a focus for, many factors in identifying and appreciating subcultures of age, ethnicity, gender, race, region, and religion.

MUS 107 three credits **C**
Fundamentals of Theory
A music course for beginners with no theory background. The study of the elements of music, systems of sounds, pitch, meter, rhythm, note values, dynamics, manuscript, etc. Identification, nomenclature, and performance will be carried out through a programmed text, lecture and practical application through singing and playing. This is a foundation course in theory and composition.

MUS 125 three credits **C, D**
Jazz: The Listener's Guide
Study of jazz based on listening and class discussion. The course is intended to increase awareness of the roots of jazz within the African-American community and of the cross-cultural fertilizations occurring throughout its more recent history. Although academic and technical studies of jazz were established in the 50s, it is only within the past fifteen years that these studies have led to the recognition of jazz as a truly valued American art form.

MUS 235 three credits **C**
Survey of American Music
American music from the Pilgrims to the present, including Folk Music, Jazz, and show tunes.

Applied Music courses are available for those who have met the prerequisites. Courses are available in piano, guitar, saxophone, voice, orchestra instruments, and electronic music.

Performance Ensembles are also open to all university students, faculty, and staff subject to the approval of the director. They may be utilized as free electives and repeated for credit.

Applied Music courses and Performance Ensembles are listed later in this section of the catalogue.

Courses Primarily for Music Majors and Minors

MUS 109, 110 two credits each **C**
Music Skills I, II
Prerequisite: MUS 107 or equivalent
An intensive study and practice of the reading, performance, notation and dictation of rhythm, meter, intervals, melody, and chords. Useful for all singers and instrumentalists.

MUS 128 one credit
Introduction to Music Technology I
Exploration of a variety of computer applications that can be utilized by musicians. After learning to use a music notation program, students investigate MIDI (Musical Instrument Digital Interface) technology. The course also covers roles of musical representation and organization through the means of notation and data.

MUS 129 one credit
Introduction to Music Technology II
Continuation of MUS 128.

MUS 155 one credit **C**
UMass Dartmouth Chorus
Open to students, staff, and faculty. Sight-reading not required but minimal experience in group singing desirable.

MUS 157 one credit **C**
Orchestra
Qualified students audition to play with the New Bedford Symphony Orchestra. The course provides opportunity for qualified students to perform standard and contemporary orchestral literature

MUS 159 one credit **C**
Wind Ensemble
This course provides an opportunity for qualified students to perform major standards and contemporary band literature

MUS 161 one credit **C**
Small Instrumental Ensembles
Small performing organizations devoted to the music repertoire of all stylistic periods.

MUS 162 one credit **C**
Gospel Choir
Performance of choral repertoire in the gospel tradition. Sight reading not required but minimal experience in group singing desirable.

MUS 163 one credit **C**
Large Jazz Ensemble
Prerequisite: Permission of instructor
Performance of traditional large ensemble repertoire focusing on the African American jazz tradition.

MUS 165, 166, 265, 266
one credit each **C**
Class Piano I, II, III, IV
Upper levels are continuation courses requiring permission of the instructor
Instruction in piano for the beginning student. No prior musical knowledge is necessary. An electronic piano laboratory will provide the setting for class instruction. Harmonic and melodic improvisation will be pursued as well as the study of keyboard skills and appropriate performance literature.

MUS 167 one credit **C**
Madrigal Singers
Prerequisite: Permission of instructor
Performance of madrigals and other works for small chorus from a variety of musical styles. Concurrent participation in MUS 155 is encouraged.

MUS 171 three credits **C**
Music Theory I
Prerequisite: MUS 107 or equivalent
An introduction to tonal harmony, including elements of pitch and rhythm, triads, voice leading and harmonic progression. This is

Gen Ed Note

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the first of four courses in music theory required of all music majors.

MUS 172 three credits **C**
Music Theory II
Prerequisite: MUS 171
Continuation of MUS 171, exploring functional harmonic practices. The uses of non-chord tones, triadic inversions, seventh chords and simple chromaticism will be studied.

MUS 203, 204 three credits each **C, G**
Survey of Western Music I, II
Prerequisites: MUS 171, 172; MUS 203 is prerequisite for MUS 204
Survey of music from the middle ages to the present. Listening and analysis will be stressed, but historical background will also be discussed. The course will include exposure to music of diverse cultures.

MUS 205 three credits
Introduction to Music Therapy
Fundamentals of music therapy, including historical and theoretical perspectives. Brain functioning is studied as a key to understanding music therapy through simple models and case studies. This course is open to all students interested in the multi-faceted uses of music therapy.

MUS 209, 210 two credits each **C**
Music Skills III, IV
Prerequisites: MUS 109, 110
Continuation of MUS 109 and 110.

MUS 215 one credit **C**
String Methods
Prerequisite: Music major, sophomore standing
Designed for those interested in teaching in the secondary school system. It will give a basic understanding of all string instruments and the techniques involved in playing them.

MUS 216 one credit **C**
Percussion Methods
Prerequisite: Music major, sophomore standing
Designed for those interested in teaching in the secondary school system. It will give a basic understanding of all percussion instruments and the techniques involved in playing them.

MUS 217 one credit **C**
Woodwind Methods
Prerequisite: Music major, sophomore standing
Designed for those interested in teaching in the secondary school system. It will give a basic understanding of all woodwind instruments and the techniques involved in playing them.

MUS 218 one credit **C**
Brass Methods
Prerequisite: Music major, sophomore standing
Designed for those interested in teaching in the secondary school system. It gives a basic understanding of all brass instruments and the techniques involved in playing them.

MUS 219, 220 one credit each **C**
Foreign Language Diction
Pronunciation of languages used in vocal music, for voice majors.

MUS 223 three credits **C**
Electronic Music Studio Techniques I
Prerequisite: MUS 172
Introduction to basics of sound, electronic music equipment, and MIDI sequencing. Lectures, readings, and studio projects are included. Rudimentary music theory knowledge is necessary, although keyboard knowledge is not required.

MUS 242 three credits **C**
African-American Music History
Prerequisite: MUS 107 or equivalent
A survey of African-American music from its African origins to the present. The course introduces the student to the vast and rich expanses of black musical culture from a stylistic, cultural, and socio-historical perspective, with a focus on jazz. Cross-listed as AAS 242.

MUS 245, 246 one credit each **C**
Applied Vocal Repertoire and Ensemble Class I, II
Various interpretive styles of composers in song and music-drama-literature: aesthetics, audience rapport, diction, dynamics, tempo, phrasing. Includes solo repertoire, the vocal small ensemble repertoire, and chamber literature with instrument and voice.

MUS 271 three credits **C**
Music Theory III
Prerequisite: MUS 172
An exploration of the chromatic aspects of tonal harmony, including secondary functions, modulation, and mode mixture. Formal structures such as binary and ternary form will also be studied. Compositional exercises will be required.

MUS 272 three credits **C**
Music Theory IV
Prerequisite: MUS 271
An expansion of harmonic vocabulary, including ninths, elevenths, and other higher-order chords, chromatic procedures of the nineteenth century and extensions of harmonic principles into the twentieth century. Compositional exercises will be required.

MUS 291 non-credit experience
Performance Workshop
Non-credit workshop taken by Music majors every semester.

MUS 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see section of catalogue on Other Learning Experiences.

MUS 305 three credits
Activities in Music Therapy
Prerequisite: MUS 205
Development of music skills as used in music therapy sessions, examined through lectures, reviewed through selective repertoire survey, and practiced through in-class music making. This class prepares students for MUS 307 through portfolio development and in-class music making opportunities.

MUS 307 three credits
Practicum in Music Therapy
Prerequisite: MUS 305
Integration of theory and practice in music therapy through in-class presentations and field experience. Students are required to prepare and present a short-term music therapy activity project for a specific community setting in the first seven weeks of the semester. Students then implement this activity project by giving a case presentation to the class and video taping their case work. Practicum sites may include a school, day care center, residential facility, or community center.

MUS 311, 312 one credit each
Jazz Piano I, II
Prerequisites: Piano proficiency and permission of instructor
A practical study of the historical styles of the jazz piano tradition with an emphasis on the inclusion of these elements in the student's developing style. Emphasis is on

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developing a jazz vocabulary through intensive work in oral response, harmonic construction, rhythmic dexterity, and spontaneous improvisation.

MUS 313 three credits
Orchestration
Prerequisite: MUS 272
An introduction to range, function, and transposition of instrumentals. Scoring projects will be assigned and selected scores will be analyzed.

MUS 314, 315 three credits **C**
Jazz Theory and Improvisation I, II
Prerequisites: MUS 171, 172, and instrumental proficiency
Jazz theory and improvisation, including scales, chord structures, progression patterns, rythmic fluency, form, and spontaneous creativity. Theoretical studies are put into practice through performance.

MUS 316 three credits
Teaching Children Music, Grades N-9
Prerequisites: Acceptance to the Music Education Option; completion of the sophomore workshop
A study of children's musical experiences in learning rhythm, in singing, in reading music, in developing listening skills, and in classroom instrumental activities coupled with pre-practicum observation in local schools. Also open to UMass Dartmouth students concentrating in Education.

MUS 317 three credits
Teaching Music in Secondary Schools
Prerequisite: Acceptance to the Music Education Option; completion of the sophomore workshop
The methods and materials of the complete music programs in Middle and High schools with required observation for pre-practicum.

MUS 318 three credits
Jazz Arranging and Composition
Prerequisite: MUS 212
A study of composition and arranging in idiomatic jazz styles, including New Orleans, swing, behop, modal and experimental traditions.

MUS 320 three credits
Keyboard Experiences for Teachers
The piano and electronic keyboards used in teaching, including: music theory adapted to keyboard harmonizations of basal series and curriculum materials, stylistic figurations, musicianship and creativity. On hand activity to develop skills and confidence is of prime importance.

MUS 322 three credits
MIDI Composition Techniques
Prerequisite: MUS 223 or permission of instructor
Developing facility in using MIDI (Musical Instrument Digital Interface) hardware and related software in a compositional framework. In addition to readings, quizzes and lectures, there will be a minimum of three hours studio work per week.

MUS 323 three credits
Scoring For Video
3 hours lecture, 3 hours studio
Prerequisite: MUS 223 or permission of instructor
Exploration of the aesthetic and technical issues relating to the synchronization of sound and video. Audio is dealt with not only through music but also through sound design (the establishment of environment through the medium of sound). Course work focuses primarily on assignments and studio projects.

MUS 324 three credits
Synthesizer Programming Techniques
Prerequisite: MUS 223 or permission of instructor
Exploration of sound design. Advanced programming techniques on analog and digital synthesizers, sound design, and the use of editor/librarian programs are explored. In addition to readings, quizzes and lectures, there will be a minimum of three hours studio work per week.

MUS 325 three credits
Recording Techniques
Prerequisite: MUS 223 or permission of instructor
Developing facility in using various digital recording media. The course provides detailed exploration of relevant equipment, recording and microphone techniques, audio post production with Pro Tools, and audio CD production. In addition to readings, quizzes and lectures, there will be a minimum of three hours group recording or individual studio time per week.

MUS 337 three credits
Music of the Twentieth Century C
Prerequisites: MUS 203, 204; or permission of instructor
Trends in twentieth century music, embracing analysis of representative works from the period and their relationships to the existing culture.

MUS 330 three credits **C**
Music of the Baroque Period
Prerequisites: MUS 203, 204
Major stylistic developments in music from 1600 to 1750. Monteverdi to Bach and Handel.

MUS 335, 336 one credit each
Composition I, II
Prerequisites: MUS 272 and permission of instructor
Advanced individual studies in music composition.

MUS 338 three credits **C**
Music of the Classical Period
Prerequisites: MUS 203, 204
An in-depth survey of musical developments from 1720 to 1827. Emphasis is on the works of Haydn, Mozart, and Beethoven.

MUS 339 three credits **C**
Music of the Romantic Period
Prerequisites: MUS 203, 204
A survey of the stylistic developments and major composers of the nineteenth century.

MUS 340 two credits
Principles of Conducting
An in-depth study of conducting techniques appropriate for choral and instrumental ensembles, combined with the study and development of score reading techniques and analytical techniques needed by the serious interpreter of music.

MUS 370 three credits **D, G**
Music and Culture of the African Diaspora
Prerequisites: A course on the history, sociology, writings, and art of non-western cultures and/or permission of instructor
A study of the culture and instrumental music, song, and dance of African people from various areas of the African continent, the Caribbean, and South, Central, and North America. In addition to readings, quizzes, and lectures, students' work includes an ensemble performance to offer a firsthand experience of African music, dance, and culture. Cross-listed as AAS 370.

Music 371 three credits **D, G**
Topics in World Music Performance
Prerequisites: A course on the history, sociology, writings, and art of non-western cultures and/or permission of instructor
Investigation of the musical traditions of Asia, Africa, the Middle East, Oceania, and the Americas with a focus on the development of playing skills in indigenous genres, as well as an understanding of their function as an expression of culture. Cross-listed as AAS 371.

Note: Students who are not majors pay course-specific fees for applied music classes. Majors may take one applied class without paying a fee but pay the fee for any additional applied music classes. The charges are modest compared to private lessons.

MUS 372 three credits **G**
Music in World Cultures
Prerequisite: A course on the history, sociology, writings, and art of non-western cultures and/or permission of instructor
The indigenous musics of Africa, Asia, the Middle East, Oceania, Europe, and the Americas, with an emphasis on the cultural and historical context of music making. Cross-listed as AAS 372.

MUS 395 three credits
Seminar in Music History
Prerequisites: MUS 203, 204
Seminar on selected topics in music history.

MUS 397 three credits
Seminar in Music Theory
Prerequisite: MUS 212 or MUS 272
A seminar on selected topics in music theory.

MUS 405 three credits
Topics in Music Therapy
Prerequisites: MUS 305, 307
Discussion of relevant topics in music therapy, with focused reading assignments and examination of topics for class presentations and dialogue. This seminar course serves as the capstone experience for the Music Therapy Minor.

MUS 412 three credits
Form and Analysis Seminar
Prerequisite: MUS 272
Selected, exemplary works from the pre-tonal, tonal and post-tonal periods will be examined in detail. Advanced techniques in analysis will be explored. Much of the emphasis will be on deducing internal theoretical structures from the works and comparing and relating these to traditional theoretical systems.

MUS 461 two to six credits
Advanced Study in Music History
Prerequisites: MUS 203, 204 and two of MUS 337, 339, 341, 343
Intensive study of research on a special topic in Music History under the direction of a faculty member.

MUS 495 three credits
Independent Study in Music
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

MUS 196, 296, 396, 496 three credits
Directed Study in Music
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

MUS 497 two to six credits
Advanced Study in Music Theory
Prerequisites: MUS 412
Intensive study or research on a special topic in music theory under the direction of a member of the music faculty.

Applied Music Courses

MUS 117 one credit
Class Guitar I
Group Applied Music Fee
Class guitar for beginners or those with slight experience. Emphasis is on learning to play simple, notated melodies and to learn chord fingerings for accompanying. Workshops on writing melodies will be included.

MUS 118 one credit **C**
Class Guitar II
Group Applied Music Fee
Continuation of MUS 117.

MUS 149, 150, 249, 250
one credit each **C**
Applied Vocal Studies I, II, III, IV
Prerequisite: Permission of instructor
Individual Applied Music Fee
Weekly private lessons.

MUS 151, 152, 251, 252
one credit each **C**
Applied Keyboard Studies I, II, III, IV
Prerequisite: Permission of instructor
Individual Applied Music Fee
Weekly private lessons.

MUS 153, 154, 253, 254
one credit each **C**
Applied Instrumental Studies I, II, III, IV
Prerequisite: Permission of instructor
Individual Applied Music Fee
Weekly private lessons.

MUS 169, 170, 269, 270 one credit each **C**
Class Voice I, II, III, IV
Group Applied Music Fee
Prerequisite: Permission of instructor
To bring to the student by observation, demonstration, participation and listening, a comprehension of the basic principles of vocal production and exposure to the vocal repertoire. Included will be vocalization, breathing language with application to literature. Besides class attendance, students participate in performances.

MUS 335, 336 one credit each
Composition I, II
Prerequisites: MUS 272 and permission of instructor
Individual Applied Music Fee
Advanced individual studies in music composition.

MUS 341, 342 one credit each
Synthesizer Performance I, II
Prerequisites: MUS 223, two semesters of 300-level electronic studio courses and permission of instructor
Individual Applied Music Fee
Advanced individual studies in Music Technology specializing in Synthesizer Performance.

MUS 343, 344 one credit each
Electronic Composition I, II
Prerequisites: MUS 223, two semesters of 300-level electronic studio courses and permission of instructor
Individual Applied Music Fee
Advanced individual studies in Music Technology specializing in Electronic Composition.

MUS 345, 346 one credit each
Sound Production I, II
Prerequisites: MUS 223, two semester of 300-level electronic studio courses and permission of instructor
Individual Applied Music Fee
Advanced individual studies in Music Technology specializing in Sound Production.

MUS 349, 350, 449, 450
one credit each
Applied Vocal Studies V, VI, VII, VIII
Prerequisite: Permission of instructor
Individual Applied Music Fee
Weekly private lessons. Vocal pedagogy will be included at each level.

MUS 351, 352, 451, 452
one credit each
Applied Keyboard Studies V, VI, VII, VIII
Prerequisite: Permission of instructor
Individual Applied Music Fee
Weekly private lessons. Piano pedagogy will be included at each level.

MUS 353, 354, 453, 454
one credit each

Note: Students who are not majors pay course-specific fees for applied music classes. Majors may take one applied class without paying a fee but pay the fee for any additional applied music classes. The charges are modest compared to private lessons.

Applied Instrumental Studies V, VI, VII, VIII
Prerequisite: Permission of instructor
Individual Applied Music Fee
Weekly private lessons. Instrumental pedagogy will be included at each level.

MUS 435, 436 one credit each
Composition III, IV
Prerequisites: MUS 336 and permission of instructor
Continuation of MUS 335, 336

MUS 441, 442 one credit each
Synthesizer Performance III, IV
Prerequisite: MUS 342 or permission of instructor
Individual Applied Music Fee
Continuation of MUS 341, 342

MUS 443, 444 one credit each
Electronic Composition III, IV
Prerequisite: MUS 344 or permission of instructor
Individual Applied Music Fee
Continuation of MUS 343, 344

MUS 445, 446 one credit each
Sound Production III, IV
Prerequisites: MUS 346 or permission of instructor
Individual Applied Music Fee
Continuation of MUS 345, 346

Theater Arts Courses

Courses in Theater Arts introduce students to the history, theory, and craft of the theater. In conjunction with them, theatrical productions offer laboratory experience. As electives they are open to all the students in the university.

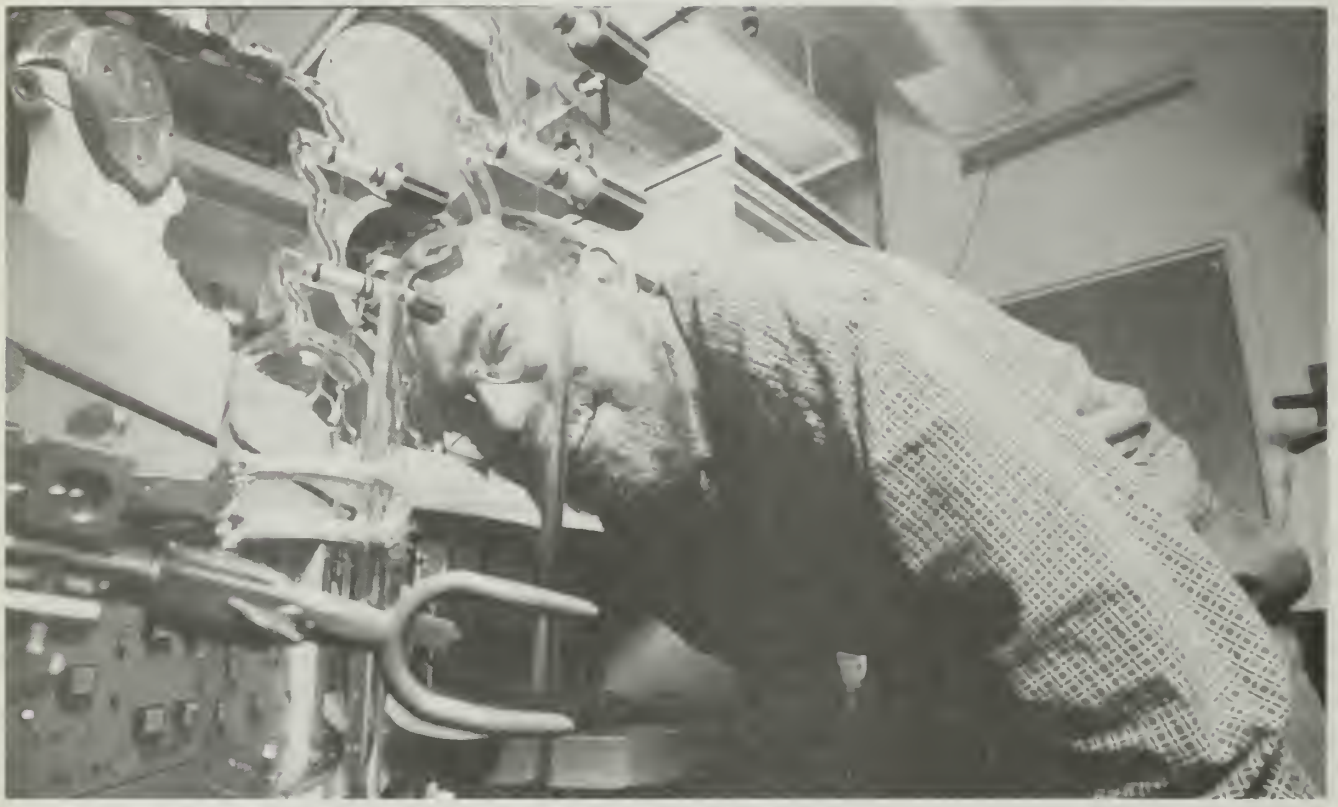
TAR 111 three credits **C**
Introduction to Theater
3 lecture credits
Introduces the student to the role of the theatre artists (playwrights, actors, directors, designers, and technicians), the unique nature of live theatrical performance, the art of theatre as an expression of human experience, and the legacy of the theatre globally and historically.

TAR 113 three credits **C**
Theater Workshop
Prerequisite: Permission of instructor (audition)
Using the creativity and talents of all enrolled students, an original ensemble theatre/performance piece is conceived, designed, written, performed, and produced by the class ensemble. Open by audition to all students interested in the visual and performing arts. May be repeated; up to 12 total credits can be used towards the undergraduate degree (credits in the previous courses TAR 100, 101, 200, 201 count toward this limit).

TAR 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see selection of catalogue on Other Learning Experiences. (Formerly listed as Contract Learning.)

TAR 295 variable credit
Independent Study
Prerequisites: permission of instructor and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

Marine Science and Technology



The School for Marine Sciences and Technology (SMAST) at UMass Dartmouth conducts research and provides instruction in the interdisciplinary areas of marine science, oceanography, engineering and technology, and policy. SMAST is a major center for research and economic development for UMass Dartmouth and the University of Massachusetts.

SMAST s faculty and staff engage in basic and applied marine science and technology investigations and interact with industries and public agencies on economic development and environmental and policy issues. While SMAST research tends to concentrate on the watersheds, embayments, and estuaries along the coastlines of Massachusetts, New England and the adjacent U.S., some of its programs are conducted in remote regions of the global oceans. SMAST is located on 2.6 acres of land in New Bedford along Clark's Cove, which empties into Buzzards Bay.

SMAST is the home at UMass Dartmouth of the Intercampus Graduate School MS and PhD programs in Marine Sciences and Technology.

Marine Sciences and Technology

Faculty and Fields of Interest

Altabet, Mark A. marine biochemistry and environmental change, stable isotopes, biogeochemistry, oceanic nitrogen cycling, paleoceanography, and paleoclimatology

Brown, Wendell S. (chairperson) coastal physical oceanography, moored ocean observations, real time circulation modeling and data/information management system development

Chen, Changsheng modeling and observational exploration of coastal ocean circulation, oceanic frontal processes, turbulent mixing/bottom boundary layer dynamics, chaotic mixing, western boundary currents, internal waves and tides, and biological/physical interaction

Goodman, Louis physical oceanography, ocean internal waves, turbulence and mixing, bottom and surface mixed layers; ocean acoustics, and autonomous underwater vehicles

Howes, Brian estuarine and embayment nutrient cycling and modeling; saltwater and freshwater wetland, lake, embayment management and restoration

MacDonald, Daniel estuarine oceanography, estuarine hydrodynamics, stratified turbulence, and environmental engineering

Rothschild, Brian (director, School for Marine Science and Technology) ocean ecosystems: marine fish population dynamics, models of plankton dynamics and interactions

Stokesbury, Kevin marine biology/ecology focusing on fisheries including scallop population dynamics and life history studies

Sundermeyer, Miles dispersion and transport processes, numerical modeling of mixing and stirring, numerical modeling of physical and biological interactions

Faculty with SMAST Joint Appointments
Primary Departments

Bisagni, James
Physics

Buck, John R.
Electrical and Computer Engineering

Fain, Gilbert
Electrical and Computer Engineering

Georgianna, Daniel L.
Economics

Gangopadhyay, Avijit
Physics

O'Connor, Nancy J.
Biology

Singh, Bal-Ram
Chemistry

Tandon, Amit
Physics

Turner, Jefferson
Biology

Programs

Graduate students who enroll in the School for Marine Sciences and Technology (SMAST) at UMass Dartmouth have access to MS and PhD degrees in Marine Sciences and Technology, which are offered through an innovative structure, the Five-Campus Intercampus Graduate School of Marine Sciences and Technology (IGS) of the University of Massachusetts.

The IGS faculty consists of faculty from four campuses—UMass Amherst, UMass Boston, UMass Dartmouth, and UMass Lowell. The IGS structure serves as an administrative umbrella for the five campus faculty, who have diverse teaching and research interests in the marine sciences and associated technologies. Dr. Brian Rothschild of UMass Dartmouth serves as the IGS Dean.

This program offers students advanced academic studies and research across a range of specializations clustered in five option areas.

At UMass Dartmouth, the administrative home of the IGS program is the **School for Marine Sciences and Technology (SMAST),** headed by Dr. Brian Rothschild as Director. SMAST offers interdisciplinary programs in the areas of marine science, oceanography, engineering and technology, and policy. Its Program Chairperson is Dr. Wendell S. Brown.

In addition to teaching, SMAST is a major center for research and economic development for UMass Dartmouth and the University of Massachusetts. Its faculty and staff engage in basic and applied marine science and technology investigations and interact with industries and public agencies on economic development and environmental and policy issues. While SMAST research tends to concentrate on the watersheds, embayments, and estuaries along the coastlines of Massachusetts, New England and the adjacent U.S., some of our programs are conducted in remote regions of the global ocean.

SMAST is located on 2.6 acres of land in New Bedford along Clark's Cove, which empties into Buzzards Bay. A description of the facilities and research program at SMAST is given in the chapter on "Graduate Opportunities at UMass Dartmouth.

Graduate Courses in Marine Sciences and Technology

MAR 510 three credits
Introductory Chemical Oceanography
Prerequisite: Enrollment in IGS or permission of instructor
Chemical oceanography starting with the basic chemical and physical properties of sea water and going through the major processes shaping chemical distributions in the ocean. A brief review of basic thermodynamics and chemical equilibria precedes a discussion of carbonate equilibria and trace metal speciation. Throughout much of the course an interdisciplinary approach is taken and pertinent material on the interaction between ocean chemistry and marine physics, biology, and geology will be presented. Whenever possible, the results of recent studies will be incorporated into class material and the last few class periods are devoted to special topics.

MAR 520 two credits
Thesis Proposal Development Seminar
Guides graduate student preparation of an acceptable master's thesis or PhD dissertation proposal in a series of papers and in-class oral presentations. Students work with a thesis advisor and committee within a framework defined by the instructor to define a thesis problem in terms of relevant literature and design a research plan, including a support budget. In the process, students are expected to improve their skills in literature research, writing, and oral presentations.

MAR 540 three credits
Introductory Fisheries Science
Provides a background on the development of fisheries science and examines the theories and techniques of biology, ecology, oceanography, and population dynamics presently employed. Components include fish and shellfish basic population dynamics, early life history recruitment, migration, growth, fishery dependent/independent surveys, alternative abundance measurement techniques, habitat considerations, and introductory fisheries modeling.

MAR 555 three credits
Introductory Physical Oceanography
Prerequisite: Permission of instructor
A descriptive treatment of ocean atmosphere interactions, water properties, general wind driven and thermohaline circulation, waves and tides, and coastal processes. Simplified conceptual models demonstrate the important principles.

MAR 560 three credits
Acoustical Oceanography
Prerequisite: Basic calculus and physics courses
Modern methods of acoustics in oceanography and the use of acoustics in other subdisciplines of the marine sciences emphasizing fundamental theories of relevance to the ocean. The course introduces students to the fundamental nature of wave propagation, the concept of acoustic impedance, sources of sound, array theory, and duct propagation. Students apply sonar equations to both passive and active acoustics. Reverberation, scattering, deep and shallow propagation are discussed. Students examine tools and techniques used in modern acoustical oceanography, including acoustical tomography, propagation through ocean internal waves, fisheries acoustics, and Doppler techniques.

MAR 572 three credits
Marine Resource Economics
Prerequisites: Graduate standing and consent of instructor (for economics undergraduates prerequisite is ECO 472)
Application of economic reasoning to understanding causes and solutions of problems faced in managing the marine environment. Students learn to analyze natural resources management issues from an economic perspective with emphasis on management of marine fisheries. Students learn how economists determine the value of environmental goods and services that are not traded in markets and about economic policy tools used to address problems such as marine pollution and other threats to the marine environment.

MAR 596 three credits
Directed Study
Prerequisite: Permission of the instructor, the SMAST Graduate Program Director, and the department chairperson.
Allows completion of a numbered course formally in the graduate program listing but not being offered as a scheduled class.

MAR 599 three credits
Special Topics in Marine Sciences and Technology
Prerequisites: Variable, depending on topic
An advanced treatment of a special topic in specific areas of marine sciences and technology with an emphasis on recent developments. The subject matter varies according to the interests of the instructor and the students.

MAR 600 up to 6 credits
Masters Thesis Research
Prerequisite: Graduate Standing and approval of student's Graduate Committee
Thesis research on an experimental or theoretical project in Marine Science or Technology under a faculty advisor.

MAR 603 three credits
Pre-Dissertation Research
Research for and preparation of doctoral dissertation proposal. The dissertation proposal must provide a thorough survey of the research activities in the research topic area and it must present original and innovative research ideas and preliminary results as well as a defined research scope and directions. PhD students must have passed this course before registering for doctoral dissertation research credits. Graded P/F.

MAR 620 four credits
Case Studies in Estuarine Dynamics
3 hours lecture, 3 hours laboratory
Prerequisite: Permission of instructor
Interdisciplinary estuarine dynamics emphasizing how interactions between physical, biological, and chemical phenomena govern major estuarine processes. The course uses two estuaries as case studies of the types of interdisciplinary problems encountered in marine ecosystems with partial focus on temperate estuarine environments. The two case studies are used to compare and contrast physical, biological, and chemical characterization of estuaries of differing watersheds, tidal dynamics, and geomorphologies. Field and laboratory studies are used to complement the theory taught in lectures and serve as a "hands on" part of the course.

MAR 622 three credits
Case Studies in Fisheries Science and Management
Prerequisite: Permission of instructor
Integration of fundamental concepts of natural science and social science relating to management of living marine resources. This course utilizes a case study of a fishery to explore how knowledge and methods from a variety of disciplines including oceanography, biology, ecology, mathematics, and economics are used together in management of marine fisheries.

MAR 630 three credits
Estuarine Biogeochemistry
Prerequisites:: Biogeochemistry or microbiology and biological oceanography or permission of instructor
Biogeochemistry of estuaries emphasizing complex interactions of the major

geochemical cycles and biological systems such as animal and plant production, nutrient uptake, and marine system transformations. Among the topics covered are the basic biogeochemical cycles as they related to both the productivity and function of estuarine systems, and the role of estuaries within the coastal zone relative to their watersheds and adjacent off shore waters. Estuaries are examined both within the global and the New England context. Current issues of estuarine management and restoration are addressed.

MAR 640 three credits
Global Marine Biogeochemistry
Prerequisite: MAR 510
Advanced treatment of marine biogeochemistry and global environmental change. The oceans play a predominant role in global environmental change particularly with respect to their major geochemical cycles of carbon, nitrogen, oxygen, phosphorus, sulfur, etc. The major features of these cycles as they operate on a global basis are presented. Examples of natural and anthropogenic perturbations at present and in the past are a major focus of this course. A significant segment of the material deals directly with the role of oceans in controlling atmospheric carbon dioxide through its biological and solubility pumps.

MAR 650 four credits
Marine Ecosystem Dynamics Modeling
Prerequisites: IGS core courses, preparation in calculus and partial differential equations, or permission of instructor
3 hours lecture, 2 hours laboratory
Structures and dynamics of ocean ecosystems. The dynamics of global to local scale biophysical interaction processes are explored in terms of basic dynamic principles. Existing ecosystem models are used to solve some realistic coastal ecosystem problems. There is a strong emphasis on solving process oriented problems requiring integration of lecture materials. A term paper is required.

MAR 660 three credits
Coastal Physical Oceanography
Prerequisite: Permission of instructor
Physics of the coastal ocean covering a wide variety of coastal physical oceanographic processes with emphasis on the continental shelf processes. Topics include tides and tidal currents, upwelling and downwelling, front processes, fresh water plumes, coastally trapped waves, boundary layer flows, and vertical and horizontal dispersion processes. This course is intended for students in IGS who require a working understanding of coastal ocean circulation and dynamics. Students enrolling in this course should be thoroughly comfortable with differential and integral calculus.

MAR 670 four credits
Advanced Time Series Analysis of Ocean and Earth System Data
Prerequisites: College calculus and introductory statistical methods
Advanced statistical tools are used to analyze ocean and earth system time series with specific application to fixed location oceanographic and meteorological data sets. Lectures describe the theoretical aspects of the advanced statistical tools that are used to analyze discrete data sets. Students use practical analysis exercises to learn the various ways to interpret set of equally spaced time and or space data series in the context of instrumental and statistical noise.

MAR 700 one credit
Graduate Seminar
Prerequisite: Graduate standing
Seminar discussions and presentations based on research or detailed literature surveys.

ECE 701 up to nine credits each
Doctoral Dissertation Research
Prerequisites: Successful completion of PhD comprehensive examination and approval of doctoral dissertation proposal by the student's graduate committee
Investigations of a fundamental and/or applied nature representing an original contribution to the scholarly research literature of the field. PhD dissertations are often published in refereed journals or presented at major conferences. A written dissertation must be completed in accordance with the rules of the Graduate School and the School for Marine Science and Technology. Admission to the course is based on successful completion of the PhD comprehensive examination and submission of a formal proposal endorsed by the student's graduate committee and submitted to the SMAST Graduate Program Director.

Division of Continuing Education

The Division of Continuing Education is committed to serve the needs of those students who choose to pursue a degree on a part-time basis during evening hours or in the summer. Any person who has graduated from high school or holds a Certificate of General Education Development (GED) is entitled to enroll in undergraduate courses offered through the Division of Continuing Education.

All credit courses offered are University of Massachusetts Dartmouth courses, and the grades earned are reflected in the student's grade point average at the university. Students may enroll in one course, a number of courses, or a program leading to a Bachelor's degree.

In addition, each term, courses are offered for personal or professional development which carry no academic credit, and a few courses for professional certification may be offered which, at their completion, award Professional Development Points (PDP's).

Many students who attend the university through the Division of Continuing Education are working full time, have family responsibilities, and have a limited amount of time available to study and attend courses. These students may have attended a community college, may have started their coursework at the university directly after high school, or may have had years elapse between their high school and university careers. All are welcome and are encouraged as they achieve each level of their education. Whether students register for courses each Fall term, each Spring term, or continue through many terms, each is advised individually while progressing toward personal academic goals.

This learning environment provides the opportunity for students, including those who are unsure of their ability to do university work, to explore academic courses, to return to school at a pace of their own choosing, to continue their education while enrolled in a degree program at another college or university, or to explore their personal interests.

The Division of Continuing Education offers opportunities at the main campus in North Dartmouth, as well as alternative learning sites at the Neighborhood College in New Bedford, the Professional and Continuing Education Center in Fall River, and Cape Cod Community College. The Neighborhood College is an outreach facility that serves the community through outreach and recruitment for adult and youth educational programs, job training, and skills development opportunities. The Professional and Continuing Education Center in Fall River offers undergraduate, graduate, and professional training in the areas of business, management, allied health, education, criminal justice, and nursing. Through a partnership with Cape Cod Community College, the Division of Continuing Education offers a Two-Plus-Two Program in Humanities/Social Sciences.

Phone: 508 999-8071

Degree Candidacy

A student may earn 30 credits (the equivalent of 10 credit courses) before applying for degree candidacy or declaring a major. Anyone who has completed 30 credits with a minimum grade point average of 2.0 (the equivalent of a C average) is eligible to be accepted into a University of Massachusetts Dartmouth degree program leading to a Bachelor's degree in one of the majors offered through the Division of Continuing Education.

When a student is accepted into a degree program, those courses that were successfully completed and which fulfill the requirements of the program will count toward graduation. All courses taken will appear on the student's transcript and will be calculated into the student's grade point average.

Undergraduate Degree Programs
At present, the UMass Dartmouth's majors in the following disciplines are available through the Division of Continuing Education:

College of Arts & Sciences
English/Literature
English/Writing and Communications
Humanities and Social Sciences
Psychology*
Sociology
Sociology/Criminal Justice
Sociology/Social Welfare

Charlton College of Business
Accounting
Management

College of Engineering
Admission to the following two programs is closed for the 2001-2002 academic year
Electrical Engineering Technology
Mechanical Engineering Technology

at **Cape Cod Community College**
Humanities and Social Sciences
UMass Dartmouth offers the junior and senior years to students who already have at least 45 completed college credits

For access to other majors, DCE students apply for admission through the Office of Undergraduate Admissions.

Tuition and Fees

Students who register through the Division of Continuing Education for credit-bearing courses pay charges based on the Fee Schedule for that Division. Students are charged a basic fee per academic credit and additional service fees. The listing of specific charges is available from the Office of Continuing Education. Tuition and fees are subject to change at the discretion of the governing authorities of the university.

Academic Counseling and Financial Aid Information

A staff of experienced professionals is available Monday through Thursday evenings to assist students in planning programs suitable to educational and career objectives. Work experience and other learning experiences may, in some instances, be translated into academic credit (see below).

The full range of financial aid programs is available to the Continuing Education student: grants, low interest educational loans and scholarships. Individuals are strongly encouraged to explore their eligibility for these programs.

Credit for Non-Traditional Prior Learning

Non-traditional prior learning is an innovative program that enables participants to gain academic credit based on previous learning experiences. It is designed for the returning adult student who would like to earn credits toward a degree, and is available to degree-seeking students. An individual's college-level skills and knowledge that have derived from prior learning or work experience will be documented during a one-semester workshop. Evaluation for credit of the documented learning experience will be completed at the end of each academic year.

* Some Psychology courses required for graduation, especially upper-division ones, may not be conveniently available during evening hours; in some cases, evening students with a pressing need to graduate may need to take one or more courses during the day.

Fall River Educational Center

In September of 2002 a new **Fall River Educational Center** opened in a former department store in the downtown area. This new venture for the Department of Continuing Education offers special educational and professional development programs for non-traditional students. The Cherry & Webb venture reflects the university's continuing collaboration with neighboring communities to expand educational opportunities in the region. The director of the center, Dennis P. Paquette, can be reached at 508 678-3636.

Special Programs and Learning Opportunities

The Microsoft IT Academy is a program designed to offer the best in cutting-edge training, materials, and hands-on experience as students prepare to take Microsoft certification exams. The Division of Continuing Education also offers intensive institutes in the arts; as well as a variety of opportunities to study abroad. There are 10-day travel-study programs, as well as month long study abroad programs. Each is designed to maximize the country and culture in which the student is immersed while studying the history, art history, anthropology, or the visual conception through painting.

Student Government

The Continuing Education Student Government (CESG) is the official representative voice of part-time students. CESG is instrumental in helping UMass Dartmouth respond to the special needs of Continuing Education students.

Contacts

General Information
508 999-8071

Advising, Arts & Science Programs
508 999-9158

Advising, Business Programs
508 999-8041

Office Hours
Monday - Thursday 8:30 am — 7:00 pm
Friday 8:30 am — 4:00 pm

www.umassd.edu/dce

Division of Continuing Education

Interdisciplinary Programs

Interdisciplinary Minors

Interdisciplinary minors involve a number of academic fields and are offered by faculty from many academic departments. But these programs do more than just convey a subject matter that happens to intersect with more than one academic field. They are interdisciplinary by design and intention, concerned with the methodological issues of interdisciplinary study and valuing the interplay of forms of dialogue used in various fields of inquiry.

Students are encouraged to contact the advisors for these programs to learn more about their range of courses, their benefits, and their challenges.

This chapter lists minors and other programs that are not contained in one specific college of the university.

Pre-Professional Programs

This chapter describes two pre-professional programs that will be of special interest to our students, **pre-med** and **pre-law**.

All degree programs at the university are pre-professional in that they prepare students to enter their chosen career fields. They allow students to enter the job market, pursue studies toward an advanced degree, or seek professional credentialing, and they are designed to meet professional standards for their fields. In addition, a number of degree programs aim specifically at preparing students for entrance into a profession that requires candidates to obtain a license or certificate after completing their required university studies. Examples include Medical Laboratory Science, Nursing, Engineering, and the program for Teacher Preparation. The descriptions of these and other programs are found in the departmental sections of this *Catalogue*.

African and African-American Studies Minor

African and African-American Studies is a multidisciplinary approach to the understanding of the society, culture, and history of Africans and people of African descent. Drawing on the expertise of scholars of the African and African-American experience in the fields of sociology, literature, the visual and performing arts, history, political science, education, economics, and anthropology, the minor has the following goals:

- To emphasize the African and African-American contribution to world development.
- To broaden and deepen students' understanding of Africa, the African diaspora, and the American identity.
- To provide students of African descent with an opportunity to pursue a program of study directly relevant to their own lives and expose as many students as possible to African and African-American studies.

African and African-American Studies Committee

John Fobanjong (program director) Political Science

Veronique Hélénon History

Everett Hoagland English

Semenya McCord Music

Ziddi Msangi Design

Carol Pimentel staff

Thomas K. Ranuga Sociology

John Rice Engineering

Bruce Rose Upward Bound

Selected Faculty in the College of Arts and Sciences, College of Business, College of Engineering, and College of Visual and Performing Arts also participate in the offering of courses.

Requirements

Each student who minors in African and African-American Studies is required to complete AAS 101 Introduction to African and African-American Studies. In addition, five elective courses must be selected, two from Group A and three from Group B. No more than two of the elective courses may be in one department. Program total: 18 credits.

Group A: Choose two courses

AAS/ECO 103	Cities, Minorities, and Poverty
AAS/MUS 125	Jazz: The Listener's Guide
AAS/HST 190	African Civilizations
AAS/ENL 200	Studies in Literature (with appropriate topic)
AAS/HST 205	African-American History I
AAS/HST 206	African-American History II
AAS/ENL 214	African-American Literature
AAS/ENL 215	West Indian and African Literature
AAS/SOC 226	Sociology of Africa
AAS/SOC 230	Black Identify and the Social World
AAS/PSC 239	African American Politics
AAS/MUS 242	African-American Music
AAS/PSC 243	Ethnic Politics
AAS/ENL 246	Women Writers
AAS/HST 290	Modern Africa

Group B: Choose three courses

AAS 298	Experiential Learning
AAS 495	Independent Study
AAS 196, 296, 396, 496	Directed Study
AAS/HST 300	Topics in American History (with appropriate topic)
AAS/PSC 303	Cape Verdean Politics and Society
AAS/PSC 306	Civil Rights
AAS/SOC 310	Social Movements
AAS/PSC 313	Urban Politics
AAS/ECO 343	The Economics of Sex and Race Discrimination
AAS/EDU 451	Contemporary Issues and Challenges
AAS/SOC 353	Readings in Sociological Literature: The Black Family
AAS/ARH 361	Art and Culture of Africa
AAS/PSC 367	African Political Systems
AAS/MUS 370	Music and Culture of the African Diaspora
AAS/MUS 371	Topics in World Music Performance
AAS/MUS 372	Music in World Cultures
AAS/HST 378	Slavery in the New World
AAS/HST 391	Topics in African History

AAS 101 three credits
Introduction to African and African-American Studies
3 hours lecture
Introduction to the principal topics in the study of Africans and African-Americans. This is the introductory course for the minor in African and African-American Studies, providing students with an encompassing framework for the African and African-American experience.

AAS 103 (ECO 103; LST 103; WMS 103)
three credits **D, E, O**
Cities, Minorities, and Poverty
Review and analysis of major social problems faced by cities; emphasis on origin, causes and possible solutions for poverty and minority problems.

AAS 125 (MUS 125) three credits **C**
Jazz: The Listener's Guide
Study of jazz based on listening and class discussion. The course is intended to increase awareness of the roots of jazz within the African-American community and of the cross-cultural fertilizations occurring throughout its recent history. Although academic and technical studies of jazz were established in the 50s, it is only within the past fifteen years that these studies have led to the recognition of jazz as a truly valued American art form.

AAS 190 (HST 190) three credits **C**
African Civilizations
An introduction to the culture, history, and civilizations of the African continent, with special emphasis on sub-Saharan Africa. This one-semester survey is designed to acquaint the student with the principal themes of African history and development from pre-historic to modern times.

AAS 200 (ENL 200, LST 200)
three credits **C**
Studies in Literature: Black Literature
Applicable to LST minor when offered with the Black Literature emphasis. May be repeated with change of content.

AAS 205 (HST 205)
three credits **C, D**
African-American History I
A survey of the role of African-Americans in American life and culture from the colonial period to the 1890s.

AAS 206 (HST 206)
three credits **C, D**
African-American History II
A continuation of the study of the role of African-Americans in American history, from the 1890s to the present.

AAS 214 (ENL 214; WMS 214)
three credits **C**
African-American Literature
Chronological survey beginning with Gustavus Vassa and Robert Hayden's "Middle Passage" and continuing through contemporary writers. Toward the end of the course there will be a focus on new women writers and major writers through the 1990s.

AAS 215 (ENL 215) three credits **C**
West Indian and African Literature
A study of important and innovative West Indian and contemporary African writers.

AAS 226 (SOC 226 or ANT 226)
three credits
Sociology of Africa
A survey of change and conflict in African society, historically and at present. Particular attention will be paid to the effects of colonialism and African resistance to it.

AAS 230 (SOC 230) three credits
Black Identity and the Social World
The course examines the African past through literature, the survival techniques which Blacks developed in order to survive in an alien world, and the collective identity of Black people at the present time. This course is especially designed for Black students and White students who are concerned with Black heritage.

AAS 239 (PSC 239) three credits **C, D**
African American Politics
A study of the role of African Americans in the American political system, both historically and contemporarily, with special attention given to the alternative political strategies used in the struggle for political inclusion. Various philosophies that have been adopted to open up the political process and increase the democratic participation of African Americans are studied.

AAS 242 (MUS 242) three credits **C**
African-American Music History
Prerequisite: MUS 107 or equivalent
A survey of African-American music from its African origins to the present. The course introduces the student to the vast and rich expanses of black musical culture from a stylistic, cultural, and socio-historical perspective, with a focus on jazz.

AAS 243 (PSC 242) three credits
Ethnic Politics
Prerequisites: PSC 101
The complex ethnic structure of the American political landscape. The course examines the role that ethnicity plays in American politics in a comparative examination of the politics of major racial and ethnic minority groups.

AAS 246 (ENL 246)
three credits **C**
Women Writers
Prerequisite: ENL 102
When the subject matter is related to the minor: an examination of the relationship between the woman writer and her work through a study of literature by and about women. Satisfies literature distribution requirement.

AAS 290 (HST 290) three credits **C, G**
Modern Africa
Survey of Africa's modern history, beginning especially after 1800. It looks at the beginnings and expansions of European and African-American settlements there, the Zulu and Islamic Revolutions, the conquest and colonization of Africa, and post-colonial developments.

AAS 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see selection of catalogue on Other Learning Experiences.

AAS 300 (HST 300) three credits
Topics in American History
When the subject matter is related to the minor: a critical analysis of selected topics or issues in African-American history.

AAS 303 (PSC 303) three credits **C, D, G**
Cape Verdean Politics and Society
A study of Cape Verdeans as an ethnic subpopulation in the United States, and as comprising an independent, self-governing nation-state. The historical, political, social, and economic contributions of Americans of Cape Verdean descent in the United States and in Cape Verde are examined.

AAS 306 (PSC 306) three credits **C, D**
Civil Rights Movements in the United States

A study of the politics of civil rights and the various philosophical approaches that have been used to extend such rights to groups that have traditionally had no access to the agenda setting processes within the legislative system. Emphasis is placed on the philosophy of nonviolence and on the political effectiveness of such organizing strategies as marches, sit-ins, and public demonstrations; and how the American experience with civil rights has influenced civil rights movements in other parts of the world.

AAS 310 (SOC 310) three credits
Social Movements I
Prerequisite: SOC 101 or permission of instructor
A sociological analysis of the origin and development of social movements with an emphasis on detailed study of particular social movements.

AAS 313 (PSC 313) three credits **G**
Urban Politics
Prerequisites: PSC 101 and upper-division standing
A critical examination of the urban political community in the United States. Particular attention is given to the adequacy of the city as an arena of conflict resolution and decision-making as well as such current problems as urban reconstruction in the ghettos. Field research in the area by individuals or groups is encouraged but not required.

AAS 337 (SOC or ANT 337) three credits **D**
Comparative Ethnic Relations
A comparative analysis of interracial and interethnic relations in various areas of the world including the U.S., Latin America, Africa, and Europe. An examination of the causes of interethnic conflict, assimilation, ethnic solidarity, and changes in ethnic identity.

AAS 343 (ECO 343) three credits **E, G**
The Economics of Sex and Race Discrimination
Prerequisites: ECO 231, 232; or permission of instructor
The theory of labor markets and the problem of discrimination. Current problems facing women and minorities will be examined. Existing programs and trends will be explored.

AAS 353 (SOC 353) three credits
Readings in Sociological Literature IV: The Black Family
Prerequisite: Permission of instructor
When the subject matter is related to the minor: directed readings and analysis in sociological topics related to the Black family.

AAS 361 (ARH 361) three credits **C, G**
Art and Culture of Africa
A survey of the arts, crafts, and architecture of Africa. Historical developments, stylistics, and aesthetics will be investigated within a socio-cultural framework.

AAS 367 (PSC 367) three credits **C, D, G**
African Political Systems
A study of the contemporary politics of African states and governments, and providing exposure to the African historical backgrounds, political cultures, political trends, and ideology. The colonial heritage of African states, the quest for modernization and nation-building, and the transition to democratic governance are explored.

AAS 370 (MUS 370) three credits **D, G**
Music and Culture of the African Diaspora
Prerequisites: A course on the history, sociology, writings, and art of non-western cultures and/or permission of instructor
A study of the culture and instrumental music, song, and dance of African people from various areas of the African continent, the Caribbean, and South, Central, and North America. In addition to readings, quizzes, and lectures, students' work includes an ensemble performance to offer a firsthand experience of African music, dance, and culture.

AAS 371 (MUS 371) three credits **D, G**
Topics in World Music Performance
Prerequisites: A course on the history, sociology, writings, and art of non-western cultures and/or permission of instructor.
Investigation of the musical traditions of Asia, Africa, the Middle East, Oceania, and the Americas with a focus on the development of playing skills in indigenous genres, as well as an understanding of their function as an expression of cultures.

AAS 372 (MUS 372) three credits **G**
Music in World Cultures
A course on the history, sociology, writings, and art of non-western cultures and/or permission of instructor.
The indigenous musics of Africa, Asia, the Middle East, Oceania, Europe, and the Americas with an emphasis on the cultural and historical context of music making.

AAS 378 (HST 378)
three credits **D**
Slavery in the New World
The trans-Atlantic slave trade and slavery in the Americas from the sixteenth to the nineteenth century. Emphasis on the beginning and development of the trans-Atlantic slave trade; moral issues, economics, and tactics of the trade; and comparisons of the slave societies of Brazil, the Caribbean, and the United States.

AAS 391 (HST 391) three credits **G**
Topics in African History
Prerequisites: HST 190 or HST 290 or written permission of the instructor
Advanced-level course for students with a background in African history. Topics will vary from year to year and may be repeated with change of content. Research papers will be required.

AAS 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

AAS 196, 296, 396, 496 variable credit
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Gerontology Certificate Program and Gerontology Minor

The University of Massachusetts Dartmouth offers a multidisciplinary gerontology certificate program and a minor. The minor is designed for degree candidates from any college in the university who wish to specialize in the gerontological aspects of their own or other disciplines.

The Certificate Program is a multidisciplinary program that is open to UMass Dartmouth students or members of the community, regardless of whether they are university degree candidates.

Although there is no gerontology major, students may use a concentration in gerontology as a key element in a self-designed multidisciplinary studies major program. See the description of multidisciplinary studies elsewhere in the catalog.

Gerontology may serve as a topical concentration of courses within the Humanities/Social Sciences major described elsewhere in this catalog.

Gerontology Faculty

Dorothy Bergeron (program coordinator) Medical Laboratory Science

Joseph A. Bronstad Foriegn Languages

Victor Caliri Psychology

Eleanor Carlson Music

John A. Chooporian Marketing/Business Information Systems

Philip Cox Philosophy

Phyllis Currier Institutional Nursing

Laura B. Forker Management/Human Resources

William Holt Psychology

Barbara Jacobskind English

Susan Leclair Medical Laboratory Science

Kathy A. Miraglia Art Education

Judy Schaaf English

Sonia M. Walgreen Economics

Certificate Program in Gerontology

Advisors for Certificate Program in Gerontology

Dorothy Bergeron (program coordinator) Professor of Medical Laboratory Science, Ext 8584

Sonia M. Walgreen Visiting Lecturer of Economics, Ext 9267

A certificate in gerontology is a credential awarded upon completion of an interdisciplinary program of study on aging in contemporary society. The credential requires twenty-four credits including a practicum. The program emphasizes the development of positive attitudes about aging and the aged, an analysis of the impact of society on aging, and the impact of the older population on society. Students will have direct contact with older adults through the practicum in order to reinforce positive attitudes toward the aging The core knowledge of all persons receiving the credential requires study in the following areas: demography of aging with regard to present and future trends in the U.S. population, biology of aging, psychosocial issues affecting older adults and caregivers, public policy, ethics, financing of health care for older adults, and health promotion for older adults. The certificate program in gerontology reflects the needs of the older population in the community and the local service network for older adults.

The certificate is designed for students enrolled at UMass Dartmouth and community members who are interested in completing the certificate requirements.

Admission
Any UMass Dartmouth student or community member wishing to pursue a Certificate in Gerontology should apply to one of the contact persons above.

Requirements

A Certificate in Gerontology will be awarded upon completion of twenty-four credits (8 courses). These include five required courses, a required practicum and two electives selected from the approved list. A student must achieve a minimum of a grade point average of 2.0 in these courses.

		Required Credits
GRT 201	Introduction to Gerontology	3
GRT/BIO 216 GRT 301 GRT 312 BIO 511	Biology of Aging **OR** Health Disorders of the Elderly **OR** Gerontological Nutrition **OR** Seminar: Biological Aspects of Aging	3
GRT 300 GRT 311 GRT /ENL 346 GRT/ECO 366	Aging, Health and Community Support **OR** Topics in Gerontology **OR** Wise Women **OR** Economics of Aging	3
GRT 309 PSY 490	Mental Health and Aging **OR** Special Topics in Psychology: Psychology of Aging	3
GRT 430	Senior Seminar	3
GRT 421	Practicum	3
	Electives (from approved list)	6
	Program total:	**24**

Approved Electives

GRT 300	Aging, Health, and Community Support
GRT 301	Health Disorders of the Elderly
GRT 302	Aging in Contemporary Society
GRT 309	Mental Health and Aging
GRT 310	Therapeutic Activities in Long-term Care
GRT 311	Topics in Gerontology
GRT 312	Gerontological Nutrition
GRT 435/AED 435	Art, Artists, Aging and Enjoyment
GRT/ECO 366	Economics of Aging
GRT/ENL 346	Wise Women
GRT/PHL 317	Ethics and Health Care Professionals
GRT/PSY 490	Special Topics in Psychology: Psychology of Aging
BIO 511	Seminar: Biological Aspects of Aging
NUR 440/441	Management in Long Term Care

Minor in Gerontology

Advisor for the Minor

Dorothy Bergeron (program coordinator) Professor of Medical Laboratory Science, Ext 8584

Gerontology studies aging, a process that may be examined from the perspective of many academic disciplines—biology, psychology, sociology, political science, economics, and health sciences among them. The gerontology minor is a multidisciplinary program supervised by faculty from many disciplines and colleges within the university.

The gerontology minor is intended to open educational and career opportunities for students who have an interest in aging. Participants will be degree candidates from any college in the university who wish to specialize in the gerontological aspects of their own and other disciplines. The minor is also appropriate for students who want to more fully understand the aging process as it relates to the individual and society. The program is structured for students without previous experience or training in gerontology.

Admission
Any undergraduate degree candidate at UMass Dartmouth who has completed 54 credits toward a baccalaureate degree and has at least a 2.5 GPA in the major and a 2.0 overall GPA may be admitted to the gerontology minor. Application for admission should be made to the program coordinator. Special students who are not UMass Dartmouth degree candidates may enroll in individual courses.

Requirements for the Minor

	Credits
GRT 201 Introduction to Gerontology	3
GRT 430 Senior Gerontology Seminar	3
Electives (from the courses listed)	12
Program total:	**18**

At least 9 of the 18 credits must be at the upper-division level.

Courses for the Gerontology Certificate Program and the Minor

GRT 201 three credits **D**
Introduction to Gerontology
An overview of gerontology is presented with emphasis on the integration of the physical, biological, psychological, social, economic and political aspects of aging. Field experience will include a series of interviews with an older person to develop an oral history.

GRT 216 (BIO 216) three credits **S**
Biology of Aging
Prerequisite: BIO 101 or equivalent
Presents the biological background to the aging process. This will include a description of the theories of aging and the developmental and physiological changes that occur throughout the aging process.

GRT 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see selection of catalogue on Other Learning Experiences.

GRT 300 three credits **D**
Aging, Health and Community Support
Prerequisite: GRT 201 or permission of instructor
The course focuses on the older adult who resides in the community. Aging is presented as a normal development stage in the life cycle. Factors that facilitate the achievement of old age as an enjoyable and satisfying time of life will be stressed. Forces that impact negatively on the quality of life of older adults will be analyzed. Relevant gerontological research will be highlighted. Support services and available resources for the older adult will be explored and provide an opportunity for student involvement with the elderly.

GRT 301 three credits
Health Disorders of the Elderly
Prerequisites: BIO 101, 102; or BIO 221, 222; or permission of instructor
The course focuses on an investigation of physiological and pathological changes which may accompany the aging process in some individuals.

GRT 302 three credits
Aging in Contemporary Society
This course introduces students to the study of aging through a focus on the social definitions, structures, relations, and problems. The differential role of gender, class, ethnicity, race and geography will be explored in relation to aging in society. Emphasis will be placed on the relationship between aging and key social institutions such as the family, community, education, religion, government, industry and health care. Students will have opportunities to explore topics through field work and/or written assignments.

GRT 309 three credits
Mental Health and Aging
This course will provide the student with an understanding of the issues in mental health and mental illness of the aged individual. The course presents an in depth discussion of the etiology, symptoms, and treatments of those mental disorders most frequently encountered in the elderly.

GRT 310 three credits
Therapeutic Activities in Long-Term Care
Prerequisite: GRT 201 or permission of instructor
Therapeutic recreation for the aging. Topics include: Omnibus Budget Reconciliation Act and Massachusetts Department of Public Health regulations, calendar planning, program development, resources and activity sharing, management, volunteerism, professionalism, and many aspects of therapeutic recreation with the aging population. Course is applicable towards Massachusetts Certification in Activities for Health Care Professionals and Day Care Recreational Professionals.

GRT 311 three credits
Topics in Gerontology
Prerequisite: GRT 201
Topics in gerontology not usually included in the gerontology curriculum will be offered.

GRT 312 three credits
Gerontological Nutrition
Prerequisite: NUR 105 or equivalent
Nutritional needs of the older adult.
This course focuses on the physiological changes that occur with the aging process and their relationship to the nutritional requirements of the elderly. Assessment of the nutritional status of elders and nutritional services available to this group will also be discussed.

GRT 317 (PHL 317) three credits
Ethics and Health Care Professionals
Prerequisite: Junior standing in Medical Laboratory Science, Nursing, Psychology or

Note: For distribution requirements, and general education requirement, cross-listed courses follow the status they have in their offering department.

Sociology
An examination of the ethical aspects of the health care professions and the impact of ethical issues on the professional's life. Topics include: responsibility, conscience, professional codes of ethics, privacy, informed consent, access to health care, loss and death.

GRT 346 (ENL 346) three credits **C**
Wise Women
Prerequisite: ENL 102
Presents a multi-disciplinary perspective of the phenomena of women and aging in American society. The experiences of older women are explored through literature, oral histories, and intergenerational class projects to determine the forces that affect quality of life and productivity in later life.

GRT 366 (ECO 366) three credits
Economics of Aging
Prerequisites: ECO 231, 232; or permission of instructor
Economic issues associated with "growing older" as well as issues and policies related to "being older"; including the economic status of the elderly, economic implications of paid work or retirement, the economics impact of social security, health care needs and costs.

GRT 421 three credits
Practicum
Prerequisites: GRT 201 and minimum of one other gerontology core course completed.
The practicum, a required course for the certificate, provides the student an opportunity to synthesize and apply knowledge about older adults either through supervised field experience or a project in gerontology. The practicum is planned to meet the individual needs of the student relative to professional background, personal interests, and career goals

GRT 430 three credits
Senior Seminar
Prerequisites: GRT 201 and the completion of at least six (6) other credits in the minor.
A culminating and integrating seminar with research components open to those accepted as candidates for the minor who have senior standing or to others with permission of the instructor.

GRT 435 (AED 435) three credits **C**
Art, Artists, Aging, and Enjoyment
Prerequisites: 200-300 level courses in Art/Art Education, or 12 or more credits in Gerontology courses, or GRT 310
Art history as it relates to the careers of older artists; the representation of age in art; the design of art programs of use to elders, and a review and practice of appropriate media will be presented in a combined lecture and studio format. May satisfy Humanities distribution requirement.

GRT 440-441 (NUR 440-441) two credits theory/one credit clinical
Nursing Management in the Long-Term Care System
Prerequisite: Nursing degree
The clinical management role of the professional nurse in the nursing care of older adults. Nursing practice occurs in skilled nursing facilities and other settings that provide students with the opportunity for clinical decision making, health promotion, health teaching, and referral within the long-term care system. Long-term care system regulatory processes, public policy, legal and ethical issues, and socioeconomic and cultural variables will be considered as they affect client outcomes.

GRT 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

GRT 196, 296, 396, 496 variable credit
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Honors Program

Director of Program

Janet Gardner English

University-wide honors activities are available to students who demonstrate high academic achievement. Students with an excellent academic record receive an invitation to participate in the Honors Colloquium Series, Honors Essay Contest, the Annual Honors Convocation and other events that recognize and encourage the achievement of honors students. Participants may engage in as few or as many activities as they desire.

Students with a cumulative grade point average at or above 3.2 may enroll in available introductory level honors sections of courses such as history, economics, political science, sociology, psychology, English, chemistry, philosophy, biology, computer science, engineering, mathematics, art history, philosophy, and physics. Students admitted to the university with test scores and/or high school records which predict university performance at honors levels receive invitations to enroll in honors sections. Nominations from secondary school teachers or counselors, and from faculty of the university may also result in invitations.

Honors Residence Area
The Honors Residence Area in Residence Hall 2, fourth flour, offers housing to honors students who select this lifestyles option. Students live in suites with other students who share an interest in the challenges offered by an honors program. The Honors Center is located on the first floor. It includes offices of the director and the secretaries, a seminar classroom where some honors courses are scheduled, and a lounge for honors students. The program plans special events programing for the center.

Students who complete the 30-credit honors program graduate as **Commonwealth Scholars**.

These students must
- complete at least 12 credits of honors courses outside the field of their major;
- complete HON 201 Multidisciplinary Approaches to Research and Writing;
- complete 9 credits of honors coursework in the major, including an honors thesis
- complete 6 additional credits in honors work.

Students may also earn honors credits for study abroad, for approved independent study, through honors contracts, and in embedded honors courses.

The University Honors Program accepts up to 12 transferred credits in honors courses from other colleges and universities in the Massachusetts public system of higher education.

For further information about the University Honors or departmental honors programs, consult the Academic Regulations and Procedures chapter of this *Catalogue* and the various departmental sections.

HON 201 three credits
Multidisciplinary Approaches to Research and Writing
Prerequisites: Successful completion of three honors courses; sophomore or junior standing; 3.2 or higher cumulative GPA
Introduction to the models of scholarly reasoning and problem-solving used in various academic disciplines. This course enables honors students to develop their critical thinking abilities across several fields of inquiry, including the sciences. Focus is on a single topic.

ENL 279 three credits
Tutoring Writing: Theory and Methods — Honors
Prerequisites: Honors Program or 3.20 GPA; by nomination and invitation only
The training course designed for the Honors Writing Fellows Program. The course provides students opportunities to learn about on-going theoretical conversations regarding composition instruction, collaborative tutoring, and writing pedagogy. Students learn to use their theoretical knowledge to determine strategies for assisting peers with their written work. One class hour per week is devoted to application in the Writing Center or in fellowing papers from a class, taping, and analyzing tutorial sessions, and interviewing faculty members about writing in the disciplines.

HON 395 three credits
Honors As Writing Fellow
Prerequisites: ENL 279 and recommendation of ENL 279 instructor
An advanced tutoring program for specially selected and trained honors students administered through the Writing/Reading Center and the University Honors Program. Writing fellows are assigned to work with students in a variety of disciplines as requested by instructors. Fellows work with about fifteen students in a class, providing written responses to first draft papers and holding individual conferences with students. Students may earn up to 6 credits by taking this course twice, fellowing for two different courses.

HON 396 three credits
Honors As Writing Fellow: Research
Prerequisites: ENL 395 and recommendation of ENL 395 instructor
A continuation of the writing fellows program for specially selected and trained honors students, administered through the Writing/Reading Center and the University Honors Program. Writing fellows taking this section are expected to fellow a different course than in HON 395. In addition, fellows serve as active mentors to students in ENL 279 and take on a serious research project in the area of tutoring, collaborative learning, writing across the curricula, or other writing program or instruction research.

HON 399 one credit
Developing Advanced Research Skills
Prerequisite: Honors program participant or permission of instructor
Seminar for honors students preparing to write their honors theses. Specific topic will vary with instructor.

HON 490/491 three credits each semester
Honors Project/Thesis I, II
Research for and preparation of an honors thesis in partial fulfillment of the University Honors Program requirements for graduation as a Commonwealth Scholar, for students whose honors research is multi-disciplinary. In the first semester, the student engages in intensive reading and research appropriate to the thesis or project, culminating in a formal, written proposal. During the second semester the student completes the writing and other preparation of the thesis or project. Students must present their results in an appropriate public forum. Students typically register to continue to complete HON 491, and an intermediate grade of IP can be given in HON 490 until there is a final grade for HON 491 which can then also be applied also to HON 490. On the other hand, a final grade can be given at the conclusion of HON 490.

HON 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

Honors Courses in the Disciplines

Honors courses in the university's subject disciplines are scheduled each semester with special criteria for size and use of a seminar format. Consult the *Course Listings* publication each semester.

International Marketing/French Certificate Program

The Omer E. and Laurette M. Boivin Center for French Language and Culture offers a Certificate Program in International Marketing/French. Any UMass Dartmouth student wishing to pursue the Certificate may apply to The Boivin Center through its Director for entrance into the program.

Director of Program

Mel Yoken Foreign Languages

Certificate Requirements

Students must have completed French courses through French 202, or have the equivalent knowledge of French. The Certificate of Studies in International Marketing/French will be awarded with the diploma at graduation, providing that the student has at least a 2.5 grade point average in Certificate courses.

		Credits
Courses in French		
FRN 301	French Composition and Conversation I	9
FRN 302	French Composition and Conversation II	
FRN 337	Commercial French	
Courses in Economics and Business		
ECO 231	Economics	12
ECO 232	Economics II	
MKT 211	Principles of Marketing	
ECO 372	International Finance **OR**	
ECO 371	International Trade	
One of the following courses (Course substitutions may be made with permission of the director)		
FIN 312	Business Finance	3
HST 329	European Economic History	
PSC 383	The Politics of International Economic Relations	
FIN 397	Financial Forecasting Methods	
FIN 398	Financial Institutions	
MKT 420	International Marketing	
ECO 371	International Trade	
FIN 494	International Financial Management	
	Total:	**24**

For full course descriptions please consult the appropriate department listings.

Judaic Studies Minor

The Judaic studies minor presents an interdisciplinary focus for studies of Jews and Judaism, including but not limited to historical, literary, linguistic, and philosophical perspectives and approaches.

The primary educational goal of this minor is to provide students with a clear idea of how different approaches to the framing and answering of questions of systematic learning deal with the same social entity over a long period of history. From this minor, the student should learn at least three things:

- some of the facts of the subject; that is, some knowledge of the history, philosophy, literature, and languages of the Jews;
- some clear knowledge of how a historian, philosopher, literary critic, or scholar of language frames humanistic questions and proceeds to answer them; and
- some ideas of what it means to look at the same subject from different perspectives.

Each student in the Judaic Studies minor is required to work closely with a faculty member in choosing courses offered through the minor. Although each student will have the flexibility to choose any course in the program, the advisers will guide the students so the program does not become a non-disciplinary exercise in Jewish studies, but a crafted effort to show how diverse disciplines within the academic community deal with a single subject. Those students completing the minor will receive recognition on their transcripts.

Judaic Studies Committee

Lewis Dars Economics

Barbara Jacobskind English

Robert P. Waxler (program director) English

Requirements

The Judaic Studies minor is open to any interested student with a cumulative GPA of at least 2.0 and with a 2.5 or higher GPA in the major.

Each student takes at least six courses within the minor, selected so that at least one course is in the area of history, one is in literature, one is in philosophy or language, and at least three are upper-division.

		Credits
JST 495	Independent Study: interdisciplinary seminar or other integrating topic	3
Five courses from the list of Judaic Studies courses		15
	Total:	**18**

Note: For distribution requirements, and general education requirement, cross-listed courses follow the status they have in their offering department.

Judaic Studies Courses

JST 213 (HST 213) three credits **C**
World of the Old Testament
An historical, sociological, and philosophical study of the world of the Old Testament and its effect upon the development of both Christianity and Islam. Special emphasis is placed upon recent archaeological discoveries which shed light upon the interaction of ancient Israel with surrounding cultures and its place in the context of Middle Eastern civilization. Lecture and discussion are supplemented with slide presentations and the display of various artifacts that reflect the lifestyles of the Biblical period.

JST 214 (HST 214) three credits **C**
The Post-Biblical World
An historical, sociological, and philosophical study of the post-Biblical world. Particular emphasis is placed upon both the origins of Christianity within the context of Jewish, Middle Eastern, and Roman history and the parallel development of Rabbinic Judaism. In addition to lecture and discussions, the class participates in a Seder Meal where the ritual practices of first-century Israel are recreated.

JST 224 (ENL 224) three credits **C**
Jewish Literature
Major written works reflecting Jewish themes. Particular emphasis is placed on changes in Jewish culture and Jewish consciousness suggested by these works and how these changes mirror universal changes in the modern West.

JST 260 (HST 260) three credits **C**
The History of the Jewish People
A survey of the social, political, and economic history of the Jewish people from the first century through the modern era. Special emphasis is placed upon Jewish-Christian and Jewish-Islamic relations and their effect upon anti-semitism, the Holocaust, and the growth and development of Zionism. The student becomes acquainted with the place of the Jewish people in the mainstream of western culture and with the problem of maintaining ethnic and religious identify in a basically hostile environment.

JST 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see selection of catalogue on Other Learning Experiences.

JST 300 three credits
Topics in Jewish Studies
Topic of concern in Jewish Studies, as announced. May be repeated with change of topic.

JST 308/WMS 308 three credits
The Jewish Woman
The diversity of Jewish women's social, cultural and religious experiences through fiction, poetry, biography, history and sociology, with an emphasis on the impact of feminism on the lives of Jewish women.

JST 356 (HST 356) three credits **G**
The Holocaust
An examination of the Holocaust, including the psychosocial aspects of prejudice; the history of anti-semitism from Biblical times; the historical, political, racist, economic, social, psychological, literary, legal, theological, and moral aspects of the Holocaust.

JST 400 (HST 400) three credits **C**
Seminar in European History: A History of Christian-Jewish Relations
An examination of the fundamental structures of Judaism and Christianity and the historical origins of the myths created by the conflict between Judaism and Christianity. The course traces the various ways these myths have worked through European history and suggests some possible solutions to the conflicts.

JST 495 three credits
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings, interdisciplinary seminar or other integrating topic. Conditions and hours to be arranged.

JST 196, 296, 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

Labor Studies Minor and Certificate Program

A labor studies background can help students prepare for future studies in labor law and labor relations, offer an opportunity to work for labor organizations and advocacy groups, and provide experience in public policy matters including employment issues such as health care, privatization, and new technology in the workplace.

The University of Massachusetts Dartmouth offers both a minor and a certificate program.

The labor studies minor offers university degree-seeking students an interdisciplinary approach to the analysis of work, workers, and the institutions they create to advance their interests as citizens of the workplace, the community, and the nation. Its primary goal is to focus the various humanistic perspectives derived from the liberal arts on the problems and conditions of labor in society. Consequently, it involves the study of labor history, political science, sociology, anthropology, economics, psychology, philosophy, and literature. It seeks to convey to students an understanding of labor as a broad social force with a constructive role to play in the solution of national and community problems.

The certificate in labor studies was created primarily to serve the needs of working adults, with a high school diploma or its equivalency, who are interested in learning more about labor issues. The aim is to help people prepare for a career in labor relations, advance in their unions, learn how to handle new issues in their workplace, or simply better understand the rich experience of workers and unions.

Labor Studies Committee

David Berger (program coordinator) Economics

Philip Cox Philosophy

John Fobanjong Political Science

Daniel Georgianna Economics

Everett Hoagland English

Betty Mitchell History

Penn Reeve Sociology and Anthropology

José A. Soler Labor Education Center

Robert Waxler English

Advisor for the Minor and Certificate Program

David Berger Professor of Economics

Minor Program in Labor Studies

Requirements

Students with a cumulative GPA of 2.0 or above and a 2.5 or higher GPA in their majors are invited to enter the labor studies minor. A course of study should be constructed around an integrating theme such as labor and socio-economic theory; race, class, and gender; or labor and American thought.

The minor requires the completion of six courses (18 credits), of which three must be at the upper-division level. There are three required courses, and a student may choose three electives from the list of designated Labor Studies courses:

		Credits
LST/HST 209	History of Labor in the United States	3
LST/PSC 326	Labor Relations: Law, Practice, and Policy	3
LST 450	Seminar in Labor Studies	3

Three electives from the following list. One of the elective courses must be at the upper-division level. There are three required courses, and a student may choose three electives from the list of designated Labor Studies courses: 9

LST 101	Introduction to Labor Studies
LST/ECO 103	Cities, Minorities, and Poverty
LST/ECO 111	Jobs, Employment, and Income
LST/ENL 200	Studies in Literature
LST/HST 205	African-American History I
LST/HST 206	African-American History II
LST 207/SOC 205	Industrial Society and Human Problems
LST/ENL 211	The American Dream
LST/ENL 214	African-American Literature
LST/ENL 218	Literature and Society
LST/PHL 226	Marx
LST/PSC 242	Ethnic Politics
LST 250	Problems in Labor Studies
LST 298	Experiential Learning
LST/SOC 301	Sociology of Work
LST/PSC 303	Cape Verdean Politics and Society
LST/SOC 305	Political Sociology
LST/PSC 306	Civil Rights Movements in the United States
LST/HST 310	American's Working Women
LST/PHL 316	Political Philosophy
LST 325/PHL326	Philosophy of Law
LST/PSC 331	Political Parties and Interest Groups
LST 340/PSC 342	Public Administration
LST/SOC 341	Community Organizing
LST/ECO 342	Labor Economics
LST/ECO 343	Economics of Sex and Race Discrimination
LST/ECO 344	Work, Jobs, and Income
LST/ECO 345	Education, Work, and Discrimination
LST 350	Issues in Labor Studies
LST/PSC 354	Contemporary Political Thought
LST/SOC 356	Wealth, Status, and Power in America
LST/HST 378	Slavery in the New World
LST/SOC 402	Sociological Theory
LST/ECO 416	History of Economic Thought
LST 443/MGT 443	Human Resources Development
LST 451/MGT 452	Human Resources Law
LST/ECO 452	Manpower and Regional Development
LST/MGT 462	Managing Diversity
LST 497	Internship in Labor Studies

Additional Political Science courses may be available for credit in the Labor Studies minor. Please check the Fall and Spring Course Listings published by the Office of University Records.

Total: 18

Certificate Program in Labor Studies

Requirements

The certificate program is open to any UMass Dartmouth student or community member. Applicants wishing to pursue a Certificate in Labor Studies should speak with David Berger, (508) 999-8256, or with the Labor Education Center staff, Group I Building, Room 106, (508) 999-8007. The certificate does not lead to a formal university degree, but students choosing to pursue a degree may apply credits earned in the certificate program.

The certificate program requires the completion of eight courses (24 credits). There are five required courses, and a student may choose three electives from the list of designated Labor Studies courses:

		Credits
LST 101	Introduction to Labor Studies	3
LST/HST 209	History of Labor in the United States	3
LST 250	Problems in Labor Studies	3
LST 350	Issues in Labor Studies	3
LST 451/MGT 452	Human Resources Law	3

Three electives from the following list. One of the elective courses must be at the upper-division level. There are three required courses, and a student may choose three electives from the list of designated Labor Studies courses: 9

LST/ECO 103	Cities, Minorities, and Poverty
LST/ECO 111	Jobs, Employment, and Income
LST/ENL 200	Studies in Literature
LST/HST 205	African-American History I
LST 207/SOC 205	Industrial Society and Human Problems
LST/HST 206	African-American History II
LST/ENL 211	The American Dream
LST/ENL 214	African-American Literature
LST/ENL 218	Literature and Society
LST/PHL 226	Marx
LST/PSC 242	Ethnic Politics
LST 298	Experiential Learning
LST/SOC 301	Sociology of Work
LST/PSC 303	Cape Verdean Politics and Society
LST/SOC 305	Political Sociology
LST/PSC 306	Civil Rights Movements in the United States
LST/HST 310	American's Working Women
LST/PHL 316	Political Philosophy
LST 325/PHL326	Philosophy of Law
LST/PSC 331	Political Parties and Interest Groups
LST340/PSC 342	Public Administration
LST/SOC 341	Community Organizing
LST/ECO 342	Labor Economics
LST/ECO 343	Economics of Sex and Race Discrimination
LST/ECO 344	Work, Jobs, and Income
LST/ECO 345	Education, Work, and Discrimination
LST/PSC 354	Contemporary Political Thought
LST/SOC 356	Wealth, Status, and Power in America
LST/HST 378	Slavery in the New World
LST/SOC 402	Sociological Theory
LST/ECO 416	History of Economic Thought
LST 443/MGT 443	Human Resources Development
LST/ECO 452	Manpower and Regional Development
LST 497	Internship in Labor Studies

Total: 24

Labor Studies Courses

LST 101 three credits
Introduction to Labor Studies
An interdisciplinary introduction to the analysis of work and workers. The course surveys the traditional history of American labor, the legal framework of current labor-management relations, the structure and function of trade unions, models of collective bargaining, and contemporary labor issues.

LST 103 (ECO 103) three credits **D, E, O**
Cities, Minorities, and Poverty
Review and analysis of major social problems faced by cities. Emphasis is placed on origin, causes, and possible solutions for poverty and minority problems.

LST 111 (ECO 111) three credits **D, E, O**
Jobs and Discrimination
Basic analysis of problems of economic growth, job creation, and unemployment; structure of work and jobs will be explored, along with current issues surrounding the government's impact on inflation, taxation, and economic planning.

LST 200 (ENL 200, AAS 200)
three credits **C**
Studies in Literature: Black Literature
Applicable to LST minor when offered with the Black Literature emphasis. May be repeated with change of content.

LST 205 (HST 205, AAS 205)
three credits **C, D**
African-American History I
A survey of the role of African-Americans in American life and culture from the colonial period to the 1890s.

LST 206 (HST 206, AAS 206)
three credits **C, D**
African-American History II
A continuation of the study of the role of African-Americans in American history, from the 1890s to the present.

LST 207 (SOC 205) three credits
Industrial Society and Human Problems
An overview of modern society, particularly our own, with an emphasis on the problems and possibilities we face today.

LST 209 (HST 209) three credits **C, D**
History of Labor in the United States
History of the American working class throughout the 19th and 20th centuries. The course will examine the experiences of both organized labor and the masses of unorganized workers, and highlight issues of race, class, gender, and ethnicity.

Note: For distribution requirements and general education requirements, cross-listed courses follow the status they have in their offering department

LST 211 (ENL 211) three credits **C**
The American Dream
A study of the meaning of success as reflected in works ranging from those of Benjamin Franklin and Horatio Alger to the plays of Arthur Miller.

LST 214 (ENL 214, AAS 214, WMS 214) three credits **C**
African-American Literature
Chronological survey beginning with Gustavus Vassa and Robert Hayden's "Middle Passage" and continuing through contemporary writers. Toward the end of the course there will be focus on new women writers and major writers through the 1990s.

LST 218 (ENL 218) three credits **C**
Literature and Society
A study of the relationship between the individual and society through readings in modern literature.

LST 226 (PHL 226) three credits **C**
Marx
An introduction to the work of Karl Marx for those students who do not necessarily have philosophical backgrounds. The thoughts of Marx will be presented in two parts. At first, the more philosophical thought of the young Marx will be examined in its relation to Hegel and his followers up to Marx's "settling of accounts" with German philosophy. The second part will deal with the more scientific phase of Marx's thought expressed in *Das Capital*. Marx's own works will form the reading in the course.

LST 242 (PSC 242, AAS 243) three credits
Ethnic Politics
Prerequisites: PSC 101
The complex ethnic structure of the American political landscape. The course examines the role that ethnicity plays in American politics in a comparative examination of the politics of major racial and ethnic minority groups. Previously offered as PSC 266.

LST 250 three credits
Problems in Labor Studies
Prerequisite: LST 101 or permission of instructor
Topics to be studied will be drawn from the following areas: Minorities in the Labor Movement: the role of women, Latinos, African-Americans, and Asian Americans in the development of the U.S. labor movement, exploration of the changing workforce in the U.S. and how the labor movement has dealt with this new reality; Contract administration and the law; Union administration, etc.

LST 298 one to six credits
Experiential Learning
Prerequisites. At least sophomore standing; permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged Graded CR/NC. For specific procedures and regulations, see selection of catalogue on Other Learning Experiences.

LST 301 (SOC 301) three credits
Sociology of Work
Prerequisite: SOC 101 or ANT 111 or SOC/ANT 113
The analysis of work in modern society, and how, historically, labor/management relations have shaped our lives.

LST 303 (PSC 303, AAS 303) three credits **C, D, G**
Cape Verdean Politics and Society
A study of Cape Verdeans as an ethnic subpopulation in the United States, and as comprising an independent, self-governing nation-state. The historical, political, social, and economic contributions of Americans of Cape Verdean descent in the United States and in Cape Verde are examined.

LST 305 (SOC 305) three credits
Political Sociology
Prerequisites: SOC 101, SOC/ANT 113, PSC 101, 102; or permission of instructor
Sociological perspectives on the study of power relationships, political communities, political processes, and institutions. The course addresses questions like, Who controls America's institutions? What are the rights and powers of ordinary citizens? How are decisions made about war and peace? About the distribution of resources? What is the relationship between political, economic, and ideological power?

LST 306 (PSC 306, AAS 306) three credits **C, D**
Civil Rights Movements in the United States
A study of the politics of civil rights and the various philosophical approaches that have been used to extend such rights to groups that have traditionally had no access to the agenda setting processes within the legislative system. Emphasis is placed on the philosophy of nonviolence and on the political effectiveness of such organizing strategies as marches, sit-ins, and public demonstrations; and how the American experience with civil rights has influenced civil rights movements in other parts of the world

LST 310 (HST 310) three credits **C, D**
American's Working Women
The experience of American working women—Black and white, native and immigrant, organized and unorganized—from the colonial period to the present day Because work is defined as productive labor, this course will examine women as paid and unpaid workers—in the marketplace as well as in the home. Some of the areas of study will be women on the frontier, women in the mills and factories, labor union women, women in the professions, and the history and politics of housework.

LST 311 (MGT 311) three credits **E, O**
Organizational Behavior
Prerequisites: ENL 265; junior standing
An interactive skills-building course to improve managerial and team performance Students will develop an understanding of themselves in relation to others in an organizational context. Class time will be allocated among short lectures, exercises, discussion, process observation, role playing, and team work research.

LST 316 (PHL 316) three credits
Political Philosophy
Prerequisite: Semester course in Philosophy or consent of instructor
A study of some of the major themes and problems traditionally considered by political philosophers. A consideration of what constitutes a political problem and a discussion of the role of philosophy with regard to such problems. The course thus combines an analytical and an historical approach in the effort to relate traditional political thought to contemporary problems.

LST 325 (PHL 326) three credits
Philosophy of Law
Prerequisite: Semester course in Philosophy or consent of instructor
Approaches to the philosophy of law. The course addresses questions like, What gives meaning to law? How is the law interpreted, or how are judicial interpretations justified? What is the relationship between law and morality, or law and culture or custom? The course examines a number of state and Supreme Court opinions (on issues like free speech and expressive liberties, reproductive issues, obscenity, legal ethics, jury nullification, and hate crime legislation) with a

critical eye toward their philosophical or juridical soundness. This course is valuable for those considering careers in law, public affairs or politics.

LST 326 (PSC 326) three credits
Labor Relations: Law, Practice, Policy
An examination of the political and legal framework of U.S. labor relations. The course will include analysis of legislation and Supreme Court and NLRB cases which shape national labor policy and define relations among workers, employers, and the state.

LST 331 (PSC 331) three credits
Political Parties and Interest Groups
Prerequisites: PSC 101 or written permission of instructor; and upper-division standing
The development and function of political parties and political interest groups in American politics. Strategies for lobbying and for creating interest groups also examined.

LST 341 (SOC 341) three credits
Community Organizing
Analysis of the theory and practice of community organizing with particular emphasis on the development of social action and community development techniques on the grass-roots level. This course will be conducted as a seminar with student participation expected in class discussions. In addition, mini-lectures, field simulations, roleplaying, guest speakers, and field observations will be utilized.

LST 340 (PSC 342) three credits
Public Administration
Prerequisites: PSC 101 and upper-division standing
Examination of the general nature of the bureaucracy in public and private organization and in various cultural contexts. Attention is given to administrative responsibility.

LST 342 (ECO 342) three credits
Labor Economics
Prerequisites: ECO 231, 232
The labor force. The following topics are examined: wages in competitive and non-competitive markets; wage structures; inequalities and discrimination; impact of unions and social standards; indexation, inflation, and unemployment.

LST 343 (ECO 343) three credits **E**
Economics of Sex and Race Discrimination
Prerequisites: ECO 231, 232; or permission of instructor
The theory of labor markets and the problem of discrimination. Current problems facing women and minorities will be examined. Existing programs and trends will be explored.

LST 344 (ECO 344, WMS 344) three credits
Work, Jobs, and Income
Prerequisites: ECO 231, 232, or permission of instructor
Study of changes in the labor force, the impact of labor market processes and how they affect work motivation, job performance and income distribution. Formerly ECO 453 (LST 453, WMS 453), and may not be repeated under this new number.

LST 345 (ECO 345, WMS 345) three credits
Education, Work, and Discrimination
Prerequisite: Any 100 or 200 level economics course; or permission of instructor
Examination of the economic and social issues associated with education and training which include productivity, employment, wages, and income distribution. Includes topics on testing, discrimination, poverty, and taxation.

LST 350 three credits
Issues in Labor Studies
Prerequisite: LST 250 or permission of instructor
Examination of contemporary issues facing labor. Topics will depend on student interests and needs. Examples of possible topics include: Technology and Labor; Jobs and the Global Economy; Occupational Safety and the Law; Labor-Management Cooperation; Productivity and Wages.

LST 354 (PSC 354) three credits
Contemporary Political Thought
Prerequisite: Upper-division standing
Survey of the recent ideological currents in advanced capitalist societies: neo-conservatism, neo-liberalism, syndicalism, postmarxian socialism, eco-anarchism, and corporate fascism. The course will focus on political thinkers who have made significant contributions to the interpretation of contemporary political and economic developments.

LST 356 (SOC 356) three credits
Wealth, Status, and Power in America
The study of the various ways in which different societies assign their members to higher and lower positions of prestige, power, and possessions. A sociological analysis of the ways in which a person's stratified rank influences personality and life opportunities in society.

LST 357 (PSC 357) three credits
Marxian Political Theory
Prerequisites: PSC 201 or 204, ECO 232, SOC 200; or permission of the instructor
The basic concepts of 'Radical' political economy. Course will include an in-depth analysis of Marx's *Capital,* Vol. I, as well as a survey of current trends in the development of a critical theory of the state.

LST 365 (MGT 365) three credits
Managing People: Theory and Practice
Prerequisites: MGT 311 and at least junior standing
An examination of the interrelated concepts of motivation and leadership. Students will explore, experientially and theoretically, historical and contemporary theories of supervising, managing, leading, and motivating people in organizational contexts. Specific "real world" tools will be examined for their efficacy in supervising and managing people.

LST 378 (HST 378) three credits **C, D**
Slavery in the New World
The trans-Atlantic slave trade and slavery in the Americas from the sixteenth to the nineteenth century. Emphasis is placed on the beginning and development of the trans-Atlantic slave trade; moral issues, economics, and tactics of the trade; and comparisons of the slave societies of Brazil, the Caribbean, and the United States.

LST 391 (HST 391, AAS 391, WMS 391) three credits **C, G**
Topics in African History
Prerequisites: HST 190 or HST 290 or written permission of the instructor
Advanced-level course for students with a background in African history. Topics will vary from year to year. Research papers will be required.

LST 402 (SOC 402) three credits
Sociological Theory
Prerequisites: SOC 101 or SOC 113 or ANT 113; and one advanced sociology course
The synthesizing and integrative functions of theory in the sociological enterprise. The course seeks to awaken an awareness of the nature and role of concepts in theory construction, and to highlight the gains and losses which accrue in all linguistic statements about the world. The work of Marx, Durkheim, Weber, Veblen, Sorokin, G.H. Mead, and R.K. Merton are given special attention, both as pioneering examples of theoretical innovation and as substantive points of departure for future inquiry.

LST 416 (ECO 416) three credits
History of Economic Thought
Prerequisites: ECO 231, 232
The development of economic thought with emphasis on the period beginning with Adam Smith and ending with J.M. Keynes. Methodological issues in economics are also considered, and questions concerning the current status and the future directions of the profession are addressed.

LST 443 (MGT 443) three credits
Human Resources Development
Prerequisites: MGT 311, 336, 365 and senior standing; for business majors only, or by permission of the appropriate department chair
The study of sets of systematic, planned activities which organizations develop for the purpose of providing people with skills/knowledge appropriate for the current health and future positive growth of the people and organization. Students will learn basic Human Resources Management skills, the roles of HRD professionals, organizational and individual needs assessment tools/skills; training and development program development tools; and HRD program evaluation skills/techniques.

LST 450 three credits
Seminar in Labor Studies
A seminar in contemporary labor issues, offered either as LST 450 or as a cross-listed course from an appropriate discipline with an appropriate topic. This seminar is to be taken at the end of the student's work in the minor. Each student will be required to produce a research project.

LST 451 (MGT 452) three credits **D**
Human Resources Law
Prerequisites: MGT 312, 365; and at least junior standing; for business majors only, or by permission of the appropriate department chair
The laws, executive orders, and political and social factors external to firms which affect their human resources management practices. Topics include ethics and social responsibility, regulatory issues, EEOC, affirmative action, performance appraisal, and discrimination in the workplace.

LST 452 (ECO 452) three credits **D**
Labor and Regional Development
Prerequisites: ECO 231, 232, or permission of instructor
Review of labor market problems and programs in growing and depressed regions, with special emphasis on New England. Attention focused on the impact of education, training and government manpower programs.

LST 462 (MGT 462) three credits **D**
Managing Diversity
Prerequisites: MGT 311, 336, 365; and at least junior standing; for business majors only, or by permission of the appropriate department chair
A skills-building course aimed at increasing awareness of the issues related to managing multicultural workplaces. Focus will be placed on the challenges and opportunities afforded leaders/managers in dynamic U.S.-based workplaces. Personal exploration of prejudices, myths/facts, and perceptions which shape effective leadership will be central to this course.

LST 495 variable credit
Independent Study
Prerequisites: Upper-division standing; permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged.

LST 196, 296, 396, 496 three credits
Directed Study
Prerequisites: Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered. Conditions and hours to be arranged.

LST 497 three credits
Labor Studies Internship
Prerequisites: 6 credits in labor studies, upper-division standing, and permission of chair of the Labor Studies Committee.

Individualized Post-Baccalaureate Certificate

Individualized study for those who already hold a bachelor's degree.

UMass Dartmouth offers those who already hold a bachelor's degree the opportunity to meet new career or work demands or satisfy personal goals through an Individualized Post-Baccalaureate Program (IPBC). In Special Student status, these students pursue non-degree study leading to a certificate without receiving formal admission to a master's degree program. The IPBC candidate receives the advantages of program planning with an advisor, a departmental commitment, and favorable timing for class registration. Depending on one's qualifications, courses in an individual's IPBC may be at the graduate or undergraduate levels or combine the two.

After forming general plans about the program of studies desired, the student applies to the academic department in which the principal studies are to be pursued, where her/his needs are discussed and qualifications reviewed and a program of specific courses is selected. A IPBC may be pursued in any academic department of the university that chooses to participate, and interdepartmental programs may also be proposed. Some departments will prepare "packages" of courses designed to meet known needs; others will rely on separate course selections to meet each candidate's needs individually. In the process of formulating a student's IPBC, the advisor must consider the availability of course offerings, in terms of both anticipated scheduling and the likelihood of space being available; when more than one department is involved, the chairperson of the other department will be consulted.

The number of courses in a IPBC is generally more than three but fewer than in a regular undergraduate minor. Students working toward IPBC certification must maintain a minimum GPA of 2.0 in the listed courses, and the department is free to establish a higher minimum level of performance. The listing of courses for the IPBC will be maintained in the student's registrar's office file. The department will indicate official completion of the IPBC, which will be recorded on the transcript, and then issue a letter of verification.

The IPBC is not a means of pursuing a formal graduate degree, a second undergraduate major or an undergraduate minor, which are available through the regular admission/re-admission programs of the university.

Those interested may request a IPBC packet at the office of Graduate Admissions, the Registrar, or an academic department. The packet describes the program and enrollment processes, indicates the documentation required from the applicant, and includes all necessary forms. Officers in Graduate Admissions can provide advice and assistance to those making initial inquiries.

Prospective IPBC students will bring the completed form to the department involved, along with their college/university transcripts showing courses and grades and completion of a baccalaureate degree (departments might require other forms of documentation, at their discretion). If agreement is reached to establish a IPBC for an applicant, its specific courses and requirements will be recorded on a second form and the department chairperson's approval will be obtained (and Dean's if so stipulated for that College). The IPBC thus serves like a contract between the student and department, establishing courses to be completed and other terms for the completion of the program and awarding of the post-baccalaureate certificate.

If a IPBC is not agreed upon, the prospective student can return to the Graduate Studies Office for additional guidance.

IPBC students may register during the previous semester, along with current juniors. As a condition, IPBC students must receive timely departmental approval prior to each registration, to insure that advising and progress-monitoring occur. Without this approval, they must register along with other Special Students just before the beginning of the semester and will receive no priority of access to registration.

IPBC students will pay the fees appropriate for Non Degree status. Those who register the semester before must pay their fees at the time of registration.

Note: Regulations indicate that most forms of financial aid are not available for this program, because of its individualized, variable curriculum.

Pre-Med Individualized Post-Baccalaureate Certificate Program

The Pre-Med Individualized Post-Baccalaureate Certificate Program is an individualized program of study designed for students who wish to pursue entrance to medical school but lack all of the prerequisite pre-med courses. UMass Dartmouth utilizes an interdepartmental committee (Pre-Med Committee) consisting of faculty members from the departments of Biology, Chemistry, Medical Laboratory Science, Physics, and Psychology, who oversee the advising and preparation of undergraduate and graduate students for medical school admission independent of their major or previous academic degrees. By enrolling for the Pre-Med Post-Baccalaureate Certificate, students avail themselves of appropriate academic advising and other UMass Dartmouth pre-med activities.

Curriculum: The actual selection of courses and total certificate credits will depend on each student's previous academic record. Qualified post-baccalaureate pre-medical, pre-dental, or pre-veterinary students, after consultation and approval by the pre-medical certificate advisor, select no more than a total of 32 credits. Of these, a maximum of 8 credits can be earned from independent/research study and/or a maximum of 16 credits in science/math elective courses.

Admission: Students interested in acceptance to this program should request a post-baccalaureate certificate packet from the Pre-Med Individualized Post-Baccalaureate Certificate Program advisor and bring the completed form to the advisor, along with a copy of all college/university transcripts showing courses, grades, and completion of a baccalaureate degree. If an agreement is reached, the advisor and student will record the specific program courses on a second form, which is submitted for approval by the Associate Vice Chancellor for Academic Affairs/Graduate Studies (Office of Graduate Studies).

For additional information, please contact Eileen Carreiro, Department of Medical Laboratory Science, 508 999-8213 or by email (ecarreiro@umassd.edu).

Pre-Law

The Pre-Law program assists students who are considering a career in law in making informed decisions and appropriate preparations to achieve their professional objectives. The program helps qualified students gain entry into a quality law school and to assist them in being well positioned to succeed in their legal education.

There is no specific Pre-Law major at most universities, including UMass Dartmouth. Pre-Law students should choose a major in which they are interested and which will help them to develop their reading and analytical skills. Popular majors among Pre-Law students include Political Science, Psychology, Economics, Business, History, and English. However, while there is no specific Pre-Law major, there are courses that students should consider taking that will help them prepare for the academic rigor of law school.

All students considering law school should make an appointment to meet with the Pre-Law advisor, who is available to assist students in evaluating and pursing a career in law. The advisor provides information about the Law School Admission Test (LSAT), and helps students navigate through the application process to assist them in their efforts to enter law school.

For information on how to contact the Pre-Law advisor, or to learn more about the Pre-Law program, visit the UMass Dartmouth Pre-Law web page at: www.umassd.edu/prelaw.

Pre-Medical

The university offers sound and appropriate preparation for study at professional schools which train physicians, veterinarians, dentists, osteopaths, podiatrists, chiropractors, nurse practitioners, and physician's associates. Students may also complete approximately two years of a pre-pharmacy program at UMass Dartmouth before transferring to an institution with a college of pharmacy.

Students interested in pursuing any of these careers should consult with one of the Pre-Medical advisers as early as possible. An 8-member Faculty Premedical Advisory Committee counsels and assists pre-med students.

Students who wish to prepare for admission into graduate schools of medicine have many options open to them. By the judicious use of electives, any student can satisfy the undergraduate preparatory course requirements of most medical schools. Preparation for medical careers requires the completion of core courses in biology, chemistry, mathematics, physics, and frequently psychology. While pre-medical students at UMass Dartmouth most commonly major in biology or chemistry, the core courses required for preparation to enter medical school can be completed in combination with any major in the University. Students contemplating medical careers are encouraged to major in whatever discipline they find interesting and satisfying, but they should do this in consultation with the pre-medical faculty advisers.

Some students have completed a bachelor's degree but would like to strengthen their background in coursework preparatory to entrance to medical, dental, or veterinary school. For them the university offers a Pre-Med version of our Post-Baccalaureate Certificate Program, described on the previous page.

Pre-Law Advisor

Kenneth Manning Political Science

Pre-Medical Advisory Committee

Alan H. Bates Chemistry

Eileen Carreiro-Lewandowski Medical Laboratory Science

Debra J. Ellis Biology

Robert Griffith Biology

Barry R. Haimson Psychology

Catherine Neto Chemistry

Kenneth Oliveira Biology

Jay Wang Physics

A Faculty Pre-Medical Advisory Committee assists all pre-medical (pre-medical, pre-dental, pre-veterinary, etc) students in their pursuit of admission to a professional school.

- The pre-med students should meet at least once each semester with an advisor from the committee who will review the student's program and progress and make recommendations.
- The committee serves as the principal source of advice in course selection for the pre-medical program.
- The committee actively seeks up-to-date information about medical school admission requirements and makes direct contact with the medical schools whenever possible
- The committee prepares letters of recommendation going to the medical schools.
- The committee advises the Student Pre-medical Association and communicates frequently with pre-med students through e-mail and a university electronic bulletin board.

Women's Studies Minor

The UMass Dartmouth Women's Studies Program provides students the opportunity to study and analyze what it means to be female in contemporary society, to discover the historical factors that have shaped the current status of women from all backgrounds and countries and to explore paths to achieve equality for all people. The program's goal is to investigate how the notion of gender, the idea of difference between the sexes, has produced certain assumptions, expectations and stereotypes. Gender alone does not yield a full understanding of women's lives, so Women's Studies courses also examine other factors, such as race, class, culture, and sexuality. Students examine not only the obstacles and difficulties that affect women, but also the courage, cooperation and achievements that can guide positive responses to ongoing challenges.

Women's Studies constitutes both a subject matter and an approach to learning. Students receive close advising from the program director; a number of courses utilize a seminar format to allow the fullest possible participation by all students; and opportunities are available for both independent research and applications of classroom learning to field experiences.

Participating Faculty

Diane Barense Philosophy

David Berger Economics

Magali Carrera Art History

Phyllis Currier Nursing

Anne Foley Education

Catherine Gardner Philosophy

Siegal Gottlieb Mathematics

Catherine Houser English

Toby Huff Sociology and Anthropology

Barbara R. Jacobskind English

Lewis Kamm Foreign Literature and Computer Science

Gerard M. Koot History

Susan Krumholz Sociology and Anthropology

Yoon Soo Lee Design

Betty L. Mitchell History

Juli L. Parker Women's Studies

Geraldine Phipps History

Jeannette E. Riley (program director) English and Women's Studies

The Minor in Women's Studies OnLine

At present, part of the Women's Studies Minor may be completed by enrollment in online Women's Studies courses offered through the division of Continuing Education. While the online courses encompass the same Women's Studies academic material as standard lecture course, they also offer Women's Studies students advanced skills with computer-based learning and the use and assessment of Internet information.

Women's Studies Minor

Students are encouraged to meet with the Program Director and program faculty to plan a course sequence that responds to their individual interests and goals. A student may take WMS courses at any time, although a minor cannot be formally declared until a student has earned 54 credits.

Requirements for the Minor

The minor in Women's Studies requires completion of at least 18 credits, of which nine must be at the upper-division level. There are three required courses: WMS 101 Introduction to Women's Studies, WMS 208 Global Perspectives on Women; and WMS 305 Contemporary Feminist Theory and Practice. Students must maintain an overall GPA of 2.0 and a GPA in their major of 2.5.

Multidisciplinary Studies and Humanities/Social Sciences Majors

Although there is no Women's Studies major, as such, students in the College of Arts and Sciences interested in the program may elect to design an individualized course of study through the Multidisciplinary Studies major (requirements for which are located elsewhere in this catalogue). Students wishing to build their major around Women's Studies should see the Director of the Women's Studies Program.

Humanities/Social Science majors may also develop a Women's Studies emphasis as a part of that major. Students interested should see their Humanities/Social Sciences adviser.

Distribution Credit for Women's Studies Courses

WMS courses satisfy distribution requirements in the department in which they are cross-listed and as specified in the course description. Students can take individual courses from the Women's Studies course offerings.

Some WMS courses that are not cross-listed also satisfy social science or humanities distribution requirements; please see the Director for additional information.

As marked, many WMS courses also satisfy general elective requirements.

Note: For distribution requirements, and general education requirement, cross-listed courses follow the status they have in their offering department

Women's Studies Courses

WMS 101 three credits **D**
Introduction to Women's Studies
Basic concepts and perspectives in Women's Studies, placing women's experience at the center of interpretation. With focus on women's history and contemporary issues, the course examines women's lives with emphasis on how gender interacts with race, class, sexual orientation, and ethnicity. The central aim is to foster critical reading and thinking about women's lives: how the interlocking systems of oppression, colonialism, racism, sexism, and ethnocentrism shape women's lives, and how women have worked to resist these oppressions.

WMS 102 (PHL 102) three credits **C, W**
Philosophical Aspects of Feminism
An introduction to philosophical reasoning, analysis of arguments and developing of critical skills, through a consideration of various topics relevant to feminism. Topics may include: presuppositions about woman's nature, abortion, sex equality, affirmative action.

WMS 103 (ECO 103) three credits **D, E, O**
Cities, Minorities, and Poverty
Review and analysis of major social problems faced by cities, emphasis on origin, causes and possible solutions for poverty and minority problems.

WMS 110 three credits
Women in Contemporary American Society
This course explores mother-daughter relationships, women and religion, changing family life, the impact of race and ethnicity on women, and other topics pertinent to women's experience in contemporary American society.

WMS 111 (ECO 111) three credits **D, E, O**
Jobs and Discrimination
Basic analysis of problems of economic growth, job creation, and unemployment, structure of work and jobs will be explored, along with current issues surrounding the government's impact on inflation, taxation, and economic planning.

WMS 200 three credits
Special Topics in Women's Studies
Topics will be determined by the faculty member and will therefore vary; course may be repeated with change of content. This course will be cross-listed with an academic department.

WMS 203 (SOC 203) three credits
Social Welfare Policy
Prerequisite: SOC 101 or 102
Theoretical framework and a cross-cultural perspective for understanding the role of the social services in our society. An exploration of the history, politics and economics of our social welfare system will be undertaken through discussion, guest speakers and field work.

WMS 204 (PSY 204) three credits **G**
Social Psychology
Prerequisite: PSY 101
The study of experimental findings, theoretical and methodological issues in understanding the individual in a social context.

WMS 207 (NUR 207) three credits
Women's' Health Issues
Women's health needs throughout the life stages. The course explores the significance of women's reproductive capacity, in a physiological, psychological, and social context and provides a framework for discussion of related issues. The course presents basic health information to assist students in promoting positive personal health.

WMS 208 three credits **D, G**
Global Perspectives on Women
Prerequisite: WMS 101 recommended
Cultural, social, and political issues involved in women's movements for development and change around the world explored through history, political theory, sociology, anthropology, literature, and art.

WMS 209 (HST 207) three credits **C, D**
Women's History in the United States: Colonial to the Present
Survey of the history of women—black and white, native and immigrant, rich and poor—in the U.S. from colonial times to the present. Among the topics to be discussed are: women's role in agrarian vs. industrial society; women and the family; women in the labor movement, female friendships and organizations, the frontier experience; women's suffrage; sex and sex roles, and the birth and growth of the feminist movement.

WMS 210 (PSY 210) three credits **W, O**
Research Methods
Prerequisites: PSY 101, 205
See course description in Psychology section.

WMS 212 (HST 212) three credits **C**
The Case of Lizzie Borden
3 hours lecture
Using primary source documents such as newspapers, wills, city directories, the federal census, etc., students will study the fascinating case of Lizzie Borden of Fall River who was accused of the brutal axe murder of her father and stepmother. Students will develop their skills in historical methodology, and participation in class discussions is emphasized.

WMS 214 (ENL 214) three credits **C**
African-American Literature
Chronological survey beginning with Gustavus Vassa and Robert Hayden's "Middle Passage" and continuing through contemporary writers. Toward the end of the course there will be focus on new women writers and major writers through the 1990s.

WMS 228 (SOC 228) three credits
Sex Roles and Sexuality in American Society
Prerequisite: Permission of instructor
The changing definitions of the roles of men and women in American Society from our experience and from a social, historical, and biological perspective. The course covers the development of male and female in the evolutionary system, human sexuality, cross-cultural sexual identities, images of male and female in American literature, movies and the popular imagination, socialization and the development of sexual identity; problems of courtship and intimacy. Satisfies Social Science distribution requirement.

WMS 245 (ENL 245) three credits **C**
Images of Women in Literature
Study of archetypes and stereotypes of women in literature from the ancient world to the present in an attempt to reevaluate traditional literary criticism and how authors have used images of women to create character, plot, etc.

WMS 246 (ENL 246) three credits **C**
Women Writers
Examination of the relationship between the woman writer and her work through a study of literature by and about women.

WMS 298 one to six credits
Experiential Learning
Prerequisites: At least sophomore standing, permission of the instructor, department chairperson, and college dean
Work experience at an elective level supervised for academic credit by a faculty member in an appropriate academic field. Conditions and hours to be arranged. Graded CR/NC. For specific procedures and regulations, see selection of catalogue on

*When a Women's Studies project is elected.

Other Learning Experiences.

WMS 300 three credits
Topics in Women's Studies
Special topics in Women's Studies. The topics will be determined by the faculty member and will therefore vary.

WMS 305 three credits **D**
Contemporary Feminist Theory and Practice
The theoretical works of contemporary feminism (1945-present), covering such theorists as Simone de Beauvoir, Adrienne Rich, Audre Lorde, Judith Butler, Luce Irigaray, and Gloria Anzaldua. Readings and discussions examine feminist theories and their applications to the lives of individual women and the practices of women's organizations and institutions.

WMS 308/JST 308 three credits
The Jewish Woman
The diversity of Jewish women's social, cultural and religious experiences through fiction, poetry, biography, history and sociology, with an emphasis on the impact of feminism on the lives of Jewish women.

WMS 310 (HST 310) three credits **C, D**
America's Working Women
This course will examine the experience of American working women: black and white, native and immigrant, organized and unorganized from the colonial period to the present day. Because work is defined as productive labor, this course will examine women as paid and unpaid workers in the marketplace as well as in the home. Some of the areas of study will be women on the frontier, women in the mills and factories, labor union women, women in the professions, and the history and politics of housework.

WMS 317 (HST 317) three credits **C**
History of European Women
A survey of women's history from the Renaissance to the present that critically examines the recent scholarship on this topic. The course will deal both with remarkable and ordinary women. Extensive use will be made of recent research on the history of the family and social demography as well as the more traditional areas of political, intellectual, and economic history. While emphasizing Western Europe, the course will include some material from the Americas and other areas.

WMS 318 (HST 318) three credits **C**
Women's Biography and Autobiography
Examines the lives of various women in the United States, Great Britain, and elsewhere both from a literary and historical perspective. Examples of women whose lives are studied are Charlotte Bronte, Sarah and Angelina Grimke, Charlotte Perkins Gilman.

WMS 324 (SOC 324 or ANT 324)
three credits
Women in Contemporary Society
The roles and status of women in contemporary societies are examined using an historical and comparative approach. The course integrates theory of sexual inequality and its relation to other forms of social inequality and empirical analysis of the actual conditions of women. Women's participation in social movements in the U.S and Third World countries is addressed as part of the analysis of the changing roles and statuses of women. Satisfies Social Science distribution requirement.

WMS 332 (PSC 332) three credits
Sex Roles and Politics
Prerequisites: PSC 101 or PSC 238 or WMS 100, and upper-division standing
An examination of the impact of gender as a variable in American politics. The course analyzes women in the electorate as candidates, as office holders, and as political participants, including participation in political organizations and lobbying groups.

WMS 333 three credits
Mothers and Daughters
Prerequisite: ENL 101
Mother/daughter relationships: biological mothers and daughters, adopted mothers and daughters, motherless daughters. Explorations are based on a multicultural perspective. The course examines how culture, patriarchy, and stereotypes of the family affect mother/daughter relationships. Topics include competition between mothers and daughters, the women's movement in their lives, feminist parenting, Lesbian mothers or daughters, and motherhood as an institution.

WMS 336 (SOC or ANT 336) three credits
Women and Social Policy
Family policy issues in the U.S. such as child care, family leave, job equity, and marriage and family relationships. U.S. public policy is compared with that of other countries.

WMS 339 (PSC 339) three credits **D**
Women and Public Policy
Prerequisites: PSC 101, and upper-division standing
Examines public policies and landmark Supreme Court opinions relating to gender equality and women's interests in the United States. Topics may include educational policies, employment policies, child care policies, health care policies, reproductive rights, and policies relating to women as criminals.

WMS 341 (SOC 341) three credits
Community Organization*
An analysis of the theory and practice of community organizing with particular emphasis on the development of social action and community development techniques on the grass-roots level. This course will be conducted as a seminar with student participation expected in class discussions. In addition, mini-lectures, field simulations, role-playing, guest speakers and field observations will be used. Satisfies Social Science distribution requirement.

WMS 343 three credits **D**
Teaching and Learning About Women
The implications of gender and sex-role stereotyping on the educational aspirations and experiences of learners and how these intersect with class and racial bias. Through readings from philosophy, psychology, and literature students will explore the roots of gender-based attitudes and consider if and how assigned learning attributes should be changed or utilized to advance women's success as learners.

WMS 344 (ECO 343) three credits **E, G**
The Economics of Sex and Race Discrimination
Prerequisites: ECO 231, 232; or permission of instructor
The theory of labor markets and the problem of discrimination. Current problems facing women and minorities will be examined. Existing programs and trends will be explored.

WMS 346 (ENL 346) three credits **C**
Wise Women
Prerequisite: ENL 102
Multidisciplinary perspective of the phenomena of women and aging in American society. The experiences of older women are explored through literature, oral histories, and intergenerational class projects to determine the forces that affect quality of life and productivity in later life.

WMS 347 (ENL 347) three credits **C**
Special Topics in Women's Literature
Advanced study of a specialized topic chosen by the instructor.

*When a Women's Studies project is elected

WMS 348 (ENL 348) three credits C, **D**
American Women Playwrights
Prerequisite: ENL 102
Analysis, evaluation, comparison, and appreciation of plays by 20th-century American women playwrights and insights into their themes and the images of women which they create.

WMS 350 (SOC/ANT 350) three credits
Readings in Sociological and Anthropological Literature I*
Prerequisite: Permission of instructor
Directed readings/analysis in selected topics.

WMS 355 (SOC 355) three credits
Social Work Practice*
Prerequisite. SOC 203
The knowledge, values and skills that underlie social work practice. We will consider the roles that social workers assume, the settings in which they work and the methods of intervention that are used in working with individual, groups, and communities. Issues related to cross-cultural social work will also be explored.

WMS 364 (HST 364) three credits **C, G**
Social and Cultural History of Russia
Topics pertaining to social classes, the development of serfdom, religion, and art and literature in Russia from the 9th Century to the present.

WMS 370 (ENL 370) three credits **W**
Women, Writing, and the Media
Prerequisite: ENL 260
Studying and writing about issues related to gender, gender-specific language, and the representation of women in various forms of media. The course focuses on discovering, exploring, researching, and writing about women's issues.

WMS 375 (PSY 375) three credits
Psychology of Sex Difference
Prerequisites: PSY 101, 205, 210
Development of sex differences, socialization practices, attitudes, values and role expectations which affect the self-concept and interpersonal relationships. This course is designed to stimulate discussion among men as well as women.

WMS 380 (ARH 380) three credits **C, D, W**
Feminist Perspectives on Art History
Prerequisites: ARH 101, 102, WMS 101; or permission of instructor
Analyzes the feminist critique of the history of art. This course will review recent critiques of both art and culture through an investigation of the production and evaluation of art and the role of the artist in Western and non-Western cultures.

WMS 385 (ARH 385) three credits **C**
Women Artists and the Histories of Art
Provides knowledge and understanding of the art made by women from the Late Medieval period through Contemporary periods of art. This study will be set in the context of specific social, familial, economic, and psychological conditions of the period in which the art was made. The course will familiarize students with recent feminist critiques of visual culture.

WMS 391 (HST 391) three credits **C, G**
Topics in African History*
Prerequisites. HST 190 or HST 290 or written permission of the instructor
Advanced-level course for students with a background in African history. Topics will vary from year to year. Research papers will be required.

WMS 408 (SOC 408) three credits
Social Service Internship*
Prerequisites: SOC 203, 355
This course will provide students with the opportunity to integrate social work theory with practice. Students will intern with an agency/organization in the community or on campus and will meet as a seminar to analyze and reflect upon their experiences and to further develop skills and knowledge about the social services in our society.

WMS 400-494 (HST 400-494) three credits **C**
Seminars in History*
Seminars will be offered variously in such fields as United States history, European history, English history, Russian history, Latin American history, Asian history, history of ideas, and the history of women. The writing of a substantial paper will be required. Content will vary with instructor.

WMS 421 (ENL 421) three credits **C**
Seminar: American Literature Theme*
Seminar in an American Literature Theme.

WMS 490 three credits
Advanced Special Topic in Women's Studies
Special topics are offered. May be repeated with change of content. This course may be cross-listed with an academic department.

WMS 495 variable credit
Independent Study
Prerequisites Upper-division standing, permission of instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area not otherwise part of the discipline's course offerings. Conditions and hours to be arranged

WMS 196, 296, 396, 496 variable credit
Directed Study
Prerequisites. Permission of the instructor, department chairperson, and college dean
Study under the supervision of a faculty member in an area covered in a regular course not currently being offered
Conditions and hours to be arranged

UMass Dartmouth/Southern New England School of Law Three-Plus-Three Program

UMass Dartmouth and the Southern New England School of Law (located 3 miles from campus in North Dartmouth) have established a joint program that will offer significant advantages to interested, qualifying students. This program offers a fast track to a law degree in six rather than seven years. The program leads to the award of a bachelor's degree by UMass Dartmouth and a Juris Doctor degree by the Southern New England School of Law.

This program allows qualified University undergraduates to substitute the first year at the Law School for the senior year at the University, thus earning the Bachelor's Degree and the Juris Doctor Degree in six years instead of the normal seven. The program is aimed primarily at students who enter the University with a strong interest in law already formed, or who develop such an interest early on, and whose career goals and legal education needs can be well served by the Southern New England School of Law.

Responsibility for the program's operation rests with a Joint Programs Committee representing the two institutions. The University membership shall include at least one faculty member from the College of Business and Industry and at least one faculty member from the College of Arts and Sciences. All faculty actively engaged in pre-law advisement shall be invited to serve on the Committee.

Program students enjoy library privileges at both institutions throughout their residence at either institution.

Eligibility for Admission to the Law School

University juniors who meet the following requirements are eligible for admission to the Law School under the terms of the program:

- In compliance with American Bar Association Standard 502(a), successful completion by the end of the junior year of three-quarters (i.e., no less than 90 credits) of the work acceptable for the bachelor's degree at the University.
- 60 credits earned in residence at the University.
- Successful completion of all university, college and major requirements for the bachelor's degree, other than (a) free electives, and (b) requirements for which a first-year Law School course is a substitute acceptable to the student's major and college.
- A cumulative grade point average of 3.0 or better.
- Submission with the application for admission to the Law School of a joint letter of recommendation from the University members of the Joint Programs Committee.
- Fulfillment of all admissions requirements normally imposed by the Law School, including acceptable performance on the Law School Admission Test.
- At least two semesters of undergraduate pre-law advisement, as described below.

Participation and Advisement

Students interested in the program are encouraged to make their interest known to a pre-law adviser as early as possible, preferably before the end of the third semester, to insure adequate advisement in meeting the eligibility requirements for accelerated admission to the Law School.

Participants in the program are essentially a self-selected set of pre-law advisees. Students identify themselves as participants by declaring themselves to the Joint Programs Committee, by agreeing to meet a pre-law adviser on a regular basis, and by participating in an orientation visit to the Law School prior to application for admission. The purposes of advisement are to provide information about the program and to review the student's progress in meeting the requirements for admission by the end of the junior year.

Each year the University members of the Joint Programs Committee shall make an evaluation of all juniors in the program and prepare a joint letter of recommendation for each student applying to the Law School.

It is understood that pre-law advisement for purposes of the program is supplementary to, and not a substitute for, regular academic advisement by faculty in the student's major and college.

The University Senior Year/Law School First Year

Program students normally will be admitted only as full-time students in the Law School and will follow the usual course of study for full-time, first-year law students (31 credits).

Upon successful completion of the first year at the Law School, the 31 credits earned will be transferred to the University as free elective credits or appropriate credit toward requirements, sufficient to complete university requirements for the bachelor's degree. The student will then graduate from the University with the rest of his or her class.

The student's first-year law grades will not be included with the student's University grades in calculating the graduating grade point average.

Students who fail to complete successfully the first year of law school, or who elect for other reasons to withdraw, may return the next semester to the University without applying for readmission as bachelor's degree candidates. Any completed course work at the Law School will be treated by the University in the same was as other transfer credit.

University seniors in their first year at the Law School will pay the same tuition and fees to the Law School as do other first-year students. Their status at the University will be that of a non-resident degree candidate, as in the case of students studying abroad. The University, tuition and fees will be waived except for the "withdrawn on exchange" fee or other fee required to maintain the status.

Other Stipulations

Participation in the program is not a guarantee of admission to the Law School. However, the intent of the program is to attract qualified students who make a good match with the Law School's profile.

The Joint Programs Committee will make every effort to insure that students receive timely and accurate advisement at all stages of the program, however, it is the participating student's responsibility to meet the program's academic and eligibility requirements, to prepare adequately for the Law School Admission Test, and to comply with all admission procedures required by the Law School.

There is nothing to prevent a program student from applying for early admission to another law school or from transferring at a later date from Southern New England School of Law to another law school. However, it is the intent of the program to appeal to students who make a conscientious choice to attend Southern New England School of Law and complete their degree there.

Teacher Education Program Facts

Southern New England School of Law

Southern New England School of Law (SNESL) is located at Faunce Corner Road in North Dartmouth in a modern, state-of-the-art facility. SNESL offers full and part-time programs in its day division and a part-time evening/weekend program. Students in all programs receive a comprehensive legal education that grounds them in knowledge and understanding of the law, legal institutions, and the responsibilities of the bar.

SNESL is an independent, non-profit, educational institution approved by the Commonwealth of Massachusetts to award the Juris Doctor degree. Graduates are eligible to sit for the Massachusetts Bar Examination and can then also be eligible to take the Bar Examinations of certain other states depending on state requirements. SNESL is accredited by the New England Association of Schools and Colleges.

Massachusetts and Federal law require us to post the success rates of our teaching certification candidates on the Massachusetts Teacher Test. These statistics reflect policies in place previously that allowed students to enter and complete the program before passing the Teacher Test.

University of Massachusetts Dartmouth

Statistics about our Teacher Preparation Program
2001-2002 Program Year

Massachusetts Teacher Test Program Completers = 64	UMass Dartmouth Tested	 Passed	 Pass Rate	State Pass Rate
Communications Literacy, Reading	60	56	93%	98%
Communications Literacy, Writing	61	54	89%	96%
Aggregate for these Basic Skills	61	52	85%	95%
Elementary	27	23	85%	9[illegible]
Social Studies	6	not shown	not shown	84%
History	1	not shown	not shown	92%
English	1	not shown	not shown	94[illegible]
Biology	1	[illegible] shown	not shown	88%
Music	2	not shown	not shown	76%
Visual Art	14	13	93%	97%
French	1	not shown	not shown	55%
Portuguese	1	not shown	not shown	10[illegible]
Aggregate for these Content Areas	55	49	89%	93%
Business	1	not shown	[illegible] shown	100%
Aggregate	1	not shown	not shown	100%
Summary Totals and Pass Rates	61	48	79%	91%

Program Information	Students in Teacher Preparation Program 374	
Students in Supervised Student Teaching	78	Avg. hours week students spent in
Student Teaching Supervising Faculty	19	student teaching = 30
Education/Art Education Faculty	9	
Other UMass Dartmouth Faculty	2	Total weeks of student teaching = [illegible]4
Part-Time Faculty	8	
Student/Faculty Ratio	4.11 to one	Total hours required = 42[illegible]

Note: When fewer than 10 persons took the test, scores are not shown.

Strengths of Our Program

1 Ar[illegible] approach [illegible] ication [illegible] the [illegible] departments as [illegible] as an [illegible] department
2 A close [illegible]
3 [illegible] and [illegible] [illegible]ses based [illegible] national and state reform [illegible]orts, emphasizing [illegible] practice and theory
4 A [illegible] standard [illegible] teacher certification [illegible] and [illegible]
5 [illegible]tudent must pass the Basic Skills test [illegible] and the [illegible] student teaching

Mission of Our Program

UMass Dartmouth offers education programs [illegible] and [illegible] teacher certification. At middle and secondary [illegible] students [illegible] an academic discipline [illegible] achieve a [illegible] professional education through [illegible] theory [illegible] practice. At the [illegible] students complete an academic major and [illegible] general [illegible] They also [illegible] the elementary [illegible] and exposure [illegible] t[illegible] and [illegible] temporary values in [illegible]

April [illegible]

Contacts

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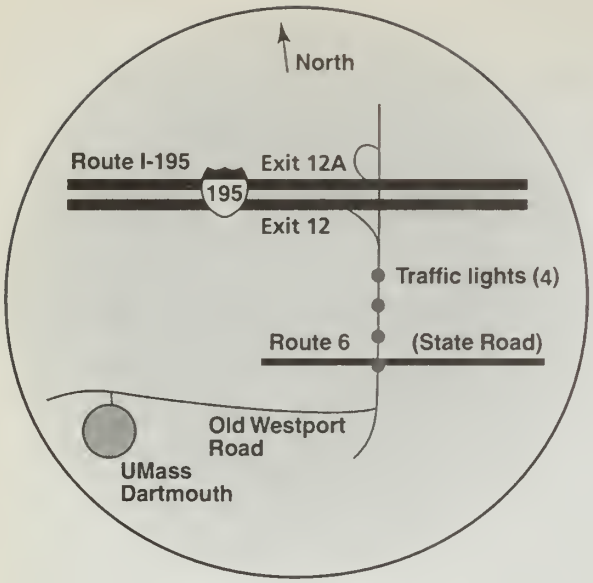

Campus Visits

Directions to UMass Dartmouth by car

From Boston and points north
Route 128/93 to Route 24 south; at exit 12 take Route 140 south to exit 2, Route I-195 west to exit 12A (See below)

From Providence, RI and points west
Route I-195 east through Fall River, MA to exit 12 (See below)

From Cape Cod and points east
Route I-195 west through New Bedford to exit 12A (See below)

From Exits 12 or 12A to the UMass Dartmouth campus
Take right off exit onto Faunce Corner Road. Proceed south, traveling across Route 6 onto Old Westport Road. At fork, bear right, staying on Old Westport Road. Campus is one mile on left.

Follow signs to visitor parking lot 4.

KEY

A	Information Booth at entrance
B	Auditorium Annex
C	Residence Halls
D	Resident Dining Hall
E	Campus Center
F	Liberal Arts & Business (GROUP I)
G	Dion Building
H	Observatory
I	Science & Engineering (GROUP II)
J	Violette Building
K	Textile Building
L	Library
M	Campanile (Tower)
N	Foster Administration
O	Visual & Performing Arts (GROUP VI)
P	Cedar Dell Village
Q	Tripp Athletic & Fitness Center
R	Campus Police
S	Athletic Fields & Tennis Courts

UMASS Dartmouth
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Directions for Correspondence or Inquiries

By mail

The departments of the university receive mail through a central post office. Address correspondence to a specific individual or department as follows:

Name of Individual
Name of Department
University of Massachusetts Dartmouth
285 Old Westport Road
North Dartmouth, MA 02747-2300

By phone

The university has both a central switchboard and direct-dial phone lines. The partial listing given below will assist one in finding key people; but the switchboard staff are always ready to assist, weekdays 7:00-6:00 pm. University police answer the central phone after these hours.

Central phone number (switchboard): 508-999-8000

Central FAX number: 508-999-8901

INTERNET addresses:
[<first initial><lastname>]@UMASSD.EDU

Office hours

University office hours are generally 8:30 to 4:30, Monday through Friday, extending into evening hours for key offices that work with evening students, until 7 pm, and with a broader schedule of hours for the library. We recommend that you call ahead for an appointment.

The university has a voice mail system; please leave a message for your party if calling after hours.

Inquiries should be addressed to the following offices or officers:

Topic	Officer or Office	Phone 508-999-XXXX	FAX 508-999-XXXX
Academics, General	Office of Academic Affairs	-8024	-8375
Arts and Sciences	Dean, College of Arts and Sciences	-8268; 8352	-9125
Business	Dean, Charlton College of Business	-8432	-8776
Engineering	Dean, College of Engineering	-8539	-9137
Nursing	Dean, College of Nursing	-8586	-9127
Visual and Performing Arts	Dean, College of Visual and Performing Arts	-8564	-9126
Marine Science and Technology	Director, School of Marine Science &Technology	-8193	-8197
Academic Advising (undergraduate)	Director, Academic Advising	-8519	-8850
Accounts—Student	Bursar	-8087	910-6643
Administration and Finance	Fiscal Affairs Division	-9130	-9138
Admission, Alternative (undergraduate)	Director, College Now Program	-8704	-9257
Admission, Graduate	Office of Graduate Studies	-8604	-8183
Admission, Undergraduate	Admissions Office	-8605	-8755
Alumni Affairs	Director, Alumni Affairs	-8031	-8773
Chancellor	Office of the Chancellor	-8004	-8860
Continuing Education, Extension	Dean, Division of Continuing Education	-8071	-8621
Equal Opportunity, Diversity, & Outreach	Assistant Chancellor	910-6405	-9201
Facilities, Plant, Grounds	Director, Physical Plant and Facilities	-8100	-9103
Financial Assistance	Director, Office of Financial Aid	-8632	-8935
Foundation	Executive Director, UMass Dartmouth Foundation	-8011	-8773
Graduate Studies	Office of Graduate Studies	-8025	-8183
Grants and Contracts	Office of Grants and Contracts	-8942	-8868
Housing	Associate Director of Housing	-8140	-8949
Information Resources and Technology	Vice Chancellor, Library Services, Information Resources and Technology	-8260	-8987
International Students	Coordinator, International Student Services	910-6633	910-6411
Library	Dean of Library Services	-8663	-8987
News and General Information	Director, News/Public Information	-8015	-9200
Personnel	Director, Human Resources	-8060	-8869
Police, Safety, Security	Chief of Safety and Security	-8107	-8122
Registration, Records, Courses	Office of University Records	-8615	-8183
Student Affairs, General	Vice Chancellor for Student Affairs	-8600	-8626
Student Life, Activities	Associate Dean of Students	-6402	910-6411
Transcripts	University Registrar	-8615	-8183

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